



Your Personal Exams Guide



NDA



CDS



SSC CGL



CBSE UGC NET



IAS



SSC CHSL



CTET



MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



SSC MTS



SBI PO



BPSC



UP TET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

RRB Group D 2018 Prev. Yr. Paper (6 Dec 2018) (Shift 2)

Total Time: 1 Hour : 30 Minute

Total Marks: 100

Instructions

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

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

Your Personal Exams Guide

CBT

1. Brazen can paint a wall red in 12 days, while Ballary can paint the entire wall in 21 days. If Brazen and Ballari work alternately for one day each from painting the wall to coloring it red, then how many hours will it take to paint the entire wall red? (+1, -0.33)
- a. 16 days
 - b. 15 days
 - c. 14 days
 - d. 12 days
-
2. Find the missing term in this series. (+1, -0.33)
- 11, 12, 13, 23, _____, 34, 19, 45, 23
- a. 14
 - b. 16
 - c. 15
 - d. 17
-
3. Which of the following number is divisible by 9? (+1, -0.33)
- a. 29039
 - b. 19239
 - c. 17139
 - d. 31239

4. An investment of Rs 3000 at a 30% annual rate of interest compounding every four months will yield an amount of Rs. _____ in a year. (+1, -0.33)
- a. 3993
 - b. 3990
 - c. 3981
 - d. 3900
-

5. Which day was 25 January 1948? (+1, -0.33)
- a. Sunday
 - b. Monday
 - c. Wednesday
 - d. Friday
-

6. The Central Government has enacted a new law - the Child Labor Amendment Act, 2016 - banning employment of children below _____ years in all occupations and procedures. (+1, -0.33)
- a. 18
 - b. 17
 - c. 14
 - d. 12
-

7. Which of the following is $\sin (90^\circ - \theta)$? (+1, -0.33)

- a. $\sin \theta$
- b. $\cot \theta$
- c. $\cos \theta$
- d. $\operatorname{cosec} \theta$

8. How many factors of $2^8 \times 3^2 \times 5^3 \times 7^5$ are even numbers? (+1, -0.33)

- a. 576
- b. 288
- c. 168
- d. 464

9. If the momentum of an object increases by 20%, its kinetic energy will increase by _____. (+1, -0.33)

- a. 66%
- b. 77%
- c. 44%
- d. 55%

10. If North-West is called North, what will West be called? (+1, -0.33)

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

11. If in the word INCOMPREHENSIBILITIES, the first and the second, third and fourth etc. letters are interchanged with each other, what will be the fifteenth letter from the left side? (+1, -0.33)

- a. M
- b. I
- c. R
- d. L

12. How many triangles are present in the picture below? (+1, -0.33)



- a. 27
- b. 22
- c. 25
- d. 21

13. _____ is a horticultural crop. (+1, -0.33)

- a. Rice
- b. Wheat
- c. Tea
- d. Peanut

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

Statement:

An advertisement in the newspaper – Managing Director of Bank XYZ said, "We do not send messages to customers nor make calls to make any corrections, updates to bank account details"

Assumption:

- (I) People are getting fake calls for stealing bank account details
- (II) Bank officials call customers to change ATM PIN

- a. Neither I nor II is implicit
- b. Only I is implicit
- c. Only II is implicit
- d. Either I or II is implicit

15. _____ are parts of the stamens. (+1, -0.33)

- a. Anthers and Suppository
- b. Anther and ovary
- c. Anthers and Filaments
- d. Anthers and Stigma

16. A train traveling at a speed of 66 km/hr crosses a 465 m long bridge in 33 seconds. How long was the train? (+1, -0.33)

- a. 240 m
- b. 160 m
- c. 180 m
- d. 140 m

17. The action of heating ores in the presence of oxygen is called (+1, -0.33)

- a. Roasting
- b. Calcination
- c. Corrosion
- d. Extraction

18. Select the appropriate combination of symbols that will be placed sequentially in place of the question mark (?) In the given equation, which will complete the equation correctly. (+1, -0.33)

$$[(100 ? 2) ? 2] ? 10 = 59$$

a. $-, \div, +$

b. $-, \times, \div$

c. $+, \times, \times$

d. $+, \div, \div$

19. Which of the following matches is correct? (+1, -0.33)

a. Butene : $\text{CH}_3 - \text{CH}_2 - \text{CH} = \text{CH}_2$

b. Propane : $\text{CH}_3 - \text{CH}_2 = \text{CH}_2$

c. Pantene : $\text{CH}_3 - \text{CH}_2 - \text{CH} - \text{CH} = \text{CH}_2$

d. Ethane : $\text{CH}_2 = \text{CH}_3$

20. _____ won the 60th Grammy Award in the Best New Artist category. (+1, -0.33)

a. Kendrick Lamar

b. Ed Sheeran

c. Ray Charles

d. Alessia Cara

21. Which of the following is denser than the density of water? (+1, -0.33)

a. Iron nail

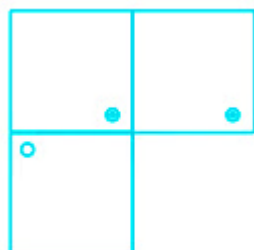
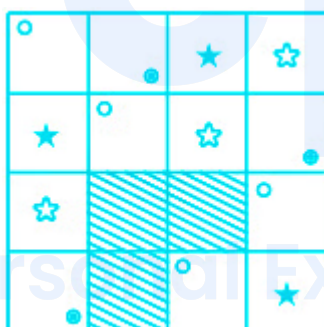
b. Ice

- c. Cork
- d. Thermocol

22. Which of the following number is the square root of 35721? (+1, -0.33)

- a. 171
- b. 201
- c. 179
- d. 189

23. Which answer figure will replace the shaded area correctly? (+1, -0.33)



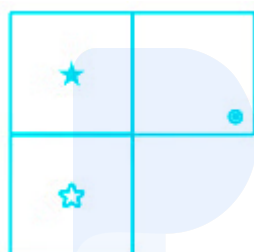
a.



b.



c.



d.

24. At what time does the mirror image of the clock show the time of 3:00 AM? (+1, -0.33)

- a. 9:00 AM
- b. 6:00 AM
- c. 3:00 AM
- d. 3:30 AM

25. What are the elements with lanthanum in Group 3, period 6 called? (+1, -0.33)

- a. Halogens

b. Transition Elements

c. Actinoid

d. Lanthanoid

-
26. Read the given statements and conclusions and decide which of the following conclusions logically follow the statement. (+1, -0.33)

Statements:

A. All leopards are lions.

B. Some tigers are leopards.

Conclusions:

I. Some tigers are lions.

II. No lion is tiger

a. Both conclusions follow

b. Only I follows

c. Neither conclusion I nor conclusion II follows

d. Only II follows

-
27. Which of the following is **not** an animal tissue? (+1, -0.33)

a. Epithelial tissue

b. Muscle tissue

c. Parenchyma

d. Connective tissue

28. Consider the following statements, even if they vary from commonly known facts and decide which conclusions logically follow the statement. (+1, -0.33)

Statements:

All D are V.

Some S are D.

No W is S.

Conclusions:

I. Some W is not D.

II. Some V are S.

III. Some D are S.

- a. Only I follows
 - b. All conclusions I, II and III follow
 - c. Only II and III follow
 - d. Only III follows
-

29. What will be the next term in the following category? (+1, -0.33)

AD4, GJ10, MP16, _ _ _ _ _.

- a. VS22
- b. SV22
- c. SV21

d. SV23

30. Triple Talaq is related to which of the following?

(+1, -0.33)

- a. Divorce
 - b. Education
 - c. Marriage
 - d. Dowry
-

31. The stem or root circle grows due to -----.

(+1, -0.33)

- a. Lateral meristem
 - b. Calary meristem
 - c. Intercalary meristem
 - d. Apical meristem
-

32. In which country was the world's first robot ski competition held?

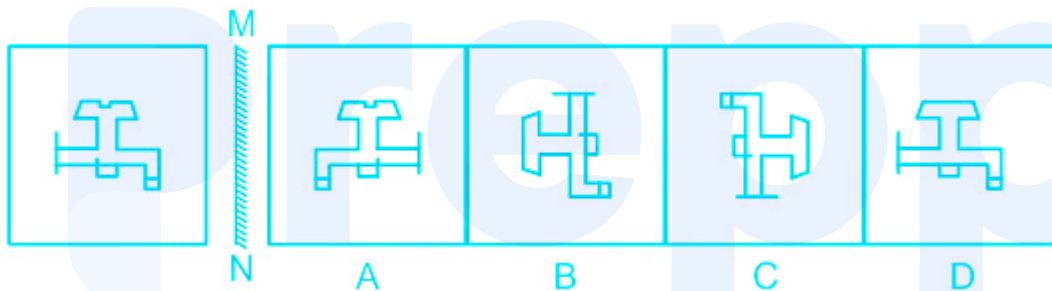
(+1, -0.33)

- a. India
 - b. Switzerland
 - c. South Korea
 - d. Russia
-

33. Two bodies of mass m and $9m$ are moving with equal kinetic energy. The ratio of their linear momentum will be _____. (+1, -0.33)

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

34. Select the mirror image of the following figure. (+1, -0.33)



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

35. If in a certain code language, PLANT is coded as QMBOU, then in that code language what will be the code for TOYOTA? (+1, -0.33)

- a. PUZUBP
- b. UPZPUB

c. UPSZPU

d. ZPUBPU

36. Which of the following numbers will have the square root rational? (+1, -0.33)

a. 46232

b. 34225

c. 14448

d. 46233

37. Manoj was running towards the south-west direction. Pankaj was walking in the opposite direction. Which direction was Pankaj going? (+1, -0.33)

a. South-West

b. North-West

c. South-East

d. North-East

38. An object moves in a straight line when the machine provides continuous power. The distance traveled by the object in time 't' will be proportional to ----- (+1, -0.33)

a. $t^{3/4}$

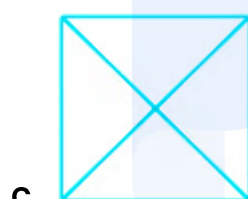
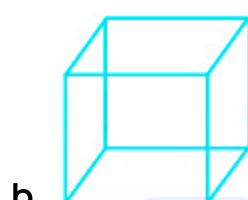
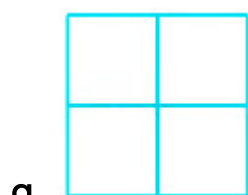
b. $t^{1/2}$

c. $t^{3/2}$

d. $t^{1/4}$

39. Find the odd diagram.

(+1, -0.33)



40. What is the relative tendency of an atom to attract electrons when it is bound to another atom?

(+1, -0.33)

- a. Electronegativity
- b. Electron attraction
- c. Quantum energy

d. Ionization energy

41. Calculate the relative molecular mass of CO_2 . (+1, -0.33)

a. 46 u

b. 44 u

c. 40 u

d. 45 u

42. _____ controls involuntary activities like coughing and sneezing. (+1, -0.33)

a. Medulla

b. Cerebrum

c. Pons

d. Cerebellum

43. The ratio of the present ages of X and Y is 3 : 8 while the ratio of the present ages of Y and Z is 4 : 5. Two years ago the age ratio of X and Y was 1 : 3. What is the sum of the present ages of the three? (+1, -0.33)

a. 126 years

b. 105 years

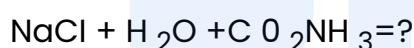
c. 63 years

d. 84 years

44. The numerical value of the area of a square is equal to half the numerical value of each of its diagonals. What is the numerical value of diagonal? (+1, -0.33)

- a. $\frac{\sqrt{2}}{2}$
- b. $\sqrt{2}$
- c. 1
- d. 2

45. This compound is sometimes added to the food for quick cooking. It is a mild non-corrosive alkali. The reaction given below shows the action of its formation. Name this compound. (+1, -0.33)



- a. Sodium Hydrogen Carbonate
- b. Ammonium Carbonate
- c. Sodium Carbonate
- d. Ammonium Chloride

46. The length of the diagonals of a rhombus is 16 cm and 12 cm. What is the perimeter of the rhombus? (+1, -0.33)

- a. 56 cm
- b. 28 cm
- c. 26 cm
- d. 40 cm

47. The chemical formula of Quick Lime (Kalichuna) is _____. (+1, -0.33)

- a. CaCO_3
- b. CaCl_2
- c. Ca(OH)_2
- d. CaO

48. Which figure will fill in the blanks and complete the series correctly? (+1, -0.33)

< << <<> _____

- a. ><<
- b. <>
- c. >>>
- d. >>

49. Which of the following statements is **not** correct regarding matter? (+1, -0.33)

- a. Matter is made up of particles.
- b. There is a difference between particles of matter.
- c. There is no attraction force between particles of matter.
- d. The particles of matter move continuously in fluid and air.

50. In the formula $M = h_i/h_o$, what do m , h_i and h_o represent? (+1, -0.33)

- a. M – Mass, h_i – Height of reflection, h_o – Height of object
- b. M – Magnification, h_i – Height of object, h_o – Height of reflection
- c. M – Magnification, h_i – Height of reflection, h_o – Height of object
- d. M – Mass, h_i – Height of object, h_o – Height of reflection

51. V is the son of K and M. M is the son of H and G. H and G are _____ of V. (+1, -0.33)

- a. Mother-Father
- b. Grandmother-Grandfather
- c. Uncle
- d. Grandmother-Grandfather (Maternal)

52. You have to decide which of these assumptions are implicit in the statement, considering the statement and the assumptions given thereafter. (+1, -0.33)

Statement:

I cannot contact you by e-mail from Krishna's house.

Assumptions:

- I. Internet facility is not available at Krishna's house.
- II. Nowadays it has become difficult to contact people on e-mail.

- a. Only assumption I is implicit
- b. Only assumption II is implicit

- c. Neither assumption I nor II is implicit
- d. Either assumption I or II is implicit

53. A sum at the same simple interest becomes amount to Rs. 457 in 5 years and Rs. 574 in 10 years. Find the value of the sum (in Rupees). (+1, -0.33)

- a. 340
- b. 420
- c. 500
- d. 280

54. What is the full form of CIBIL? (+1, -0.33)

- a. Central Information Bureau India Limited
- b. Code Information Bureau India Limited
- c. Credit Information Bureau India Limited
- d. Commercial Information Bureau India Limited

55. You are given a question and two statements. Find out which statement is necessary / sufficient to answer the question. (+1, -0.33)

Question:

How many pages of crime novel did Katir read on Saturday?

Statement:

I: Katir read the last 50 pages of the book on Sunday morning.

II. The book contains 450 pages, of which two-thirds of the pages were read before Saturday.

- a. The collected information of both I and II statements is necessary
- b. Only statement II is sufficient
- c. Only statement I or statement II alone is sufficient
- d. Only statement I is sufficient

56. Kanchenjunga is the highest peak in India situated in _____. (+1, -0.33)

- a. Uttarakhand
- b. Arunachal Pradesh
- c. Himachal Pradesh
- d. Sikkim

57. What will come in the place of the question mark '?' in the following question? (+1, -0.33)

$$4.5 - [2 - 0.25 \{4 - 6 \div (2.7 - 0.7)\}] = ?$$

- a. 2.75
- b. 3.00
- c. 2.50
- d. 3.25

58. Find the missing number in the given series.

(+1, -0.33)

22, 4, 26, 8, 30, 12, 34, 16, 38, ?

- a. 20
- b. 24
- c. 34
- d. 42

59. A can do a work alone in 11 days while B takes 16.5 days to do it alone. It takes 5.5 days for them to complete the work together with C. If C and D can work together in 22 days, then how many days will D need to complete the work alone?

(+1, -0.33)

- a. 44
- b. 66
- c. 55
- d. 77

60. Where was the world's first thermal battery making facility inaugurated?

(+1, -0.33)

- a. New Delhi
- b. Andhra Pradesh
- c. Tamil Nadu
- d. Kerala

61. To represent the speed of 72 kmh^{-1} in ms^{-1} , we will write _____. (+1, -0.33)

- a. 20
- b. 72000
- c. 2.0
- d. 200

62. The right to privacy is mentioned under which part of the Indian Constitution? (+1, -0.33)

- a. Part IV
- b. Part I
- c. Part III
- d. Part II

63. If electric charge (Q) and time (t) are given, what will be the formula for finding electric current (I)? (+1, -0.33)

- a. t / Q
- b. $Q \times t$
- c. Q / t
- d. $Q - t$

64. What will be the difference of $\frac{25}{12}$ and $\frac{15}{8}$? (+1, -0.33)

a. $\frac{7}{13}$

b. $\frac{10}{4}$

c. $\frac{5}{24}$

d. $\frac{10}{24}$

65. The mean of the 5 smallest numbers in a group is 19, while collectively the average of all 13 numbers in the group is 21 then what is the mean of the largest 8 numbers of the group? (+1, -0.33)

a. 23.50

b. 23.75

c. 22.25

d. 22.75

66. Construction of _____ was started in AD 1632 and was completed in late 1648 AD (+1, -0.33)

a. Taj Mahal

b. Red Fort

c. Qutub Minar

d. Moti Mahal

67. Akila is sweeping a square hall, whose entrance is in the east direction. After entering the room, Akila starts cleaning her right side. On each (+1, -0.33)

sweep she makes an angle of 90° with the broom. Which direction is the broom now?

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

68. Prime Minister Narendra Modi was the Chief Minister of which state during the tenure from 2001 to 2014? (+1, -0.33)

- a. Bihar
- b. Rajasthan
- c. Gujrat
- d. Uttar Pradesh

69. The tank has two taps. Tap A is to fill the tank and tap B is to empty the tank. If only tap A can fill the tank in 35 hours, only tap B can empty the filled tank completely in 70 hours. Find how many hours it will take to fill the half empty tank completely. (+1, -0.33)

- a. 40 hours
- b. 70 hours
- c. 35 hours
- d. 55 hours

70. _____ implemented the doctrine of lapse or usurpation policy. (+1, -0.33)

- a. Lord Hastings
- b. Lord Wellsley
- c. Lord Cornwallis
- d. Lord Dalhousie

71. An amount of Rs 200 was invested in a one-year plan, in which 10% annual simple interest was offered, compounded annually in interest. Another amount of Rs 200 was invested in a one-year plan at 10% per annum, but interest was compounded half-yearly. How much more will be the interest earned under the second plan? (+1, -0.33)

- a. 10 paisa
- b. 25 paisa
- c. 1 paisa
- d. 50 paisa

72. Who is the author of the novel Swami and Friends? (+1, -0.33)

- a. A K Ramanujan
- b. R K Lakshman
- c. R K Narayan
- d. Anita Nair

73. What will be the color of litmus solution when mixed with sulfuric acid? (+1, -0.33)

- a. Orange
- b. Blue
- c. Red
- d. Pink

74. Select a figure which is different from other figures. (+1, -0.33)



- a. b
- b. e
- c. a
- d. d

75. The number of regular polygons that can be recursively form by sharing arms to each other is _____. (+1, -0.33)

- a. 3
- b. 4
- c. 6
- d. 2

76. 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)

Book : Chapter :: Car : ?

- a. Sharing
- b. Steering
- c. Cockpit
- d. Pedal

77. Read the statement and identify the logical conclusion based on the given information. (+1, -0.33)

Statement:

A teacher told a parent, "This child needs to be counseled for his bad behavior."

Conclusion:

I. Counseling is one of the ways to correct behavioral problems.

II. Counseling is the only way to correct the behavior.

- a. Only conclusion II is correct
- b. Both I and II are true
- c. Only conclusion I follows
- d. Neither conclusion I nor II is correct

78. The resistance of the wire is in the inverse ratio of _____. **(+1, -0.33)**

- a. Temperature
 - b. Resistivity
 - c. Length
 - d. Cross-section area
-

79. A sound source sends waves of frequency 400 Hz and 2.5 m wavelength. **(+1, -0.33)**
What will be the speed of sound waves?

- a. 1000 m / s
 - b. 10000 m / s
 - c. 100 m / s
 - d. 10 m / s
-

80. An object was thrown upwards at a speed of 14 ms⁻¹ and flew 10 m high. **(+1, -0.33)**
Calculate the time taken by the object to reach the highest point.

- a. 1.63 s
 - b. 1.43 s
 - c. 1.53 s
 - d. 1.33 s
-

81. You are given a question and two equations. Find which equation (s) is / are sufficient to answer the question. (+1, -0.33)

Find the value of z , if

1) $\left(A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 0 \\ 0 & z \end{bmatrix} \right)$

2) $AB = A$

- a. Only 2 is enough
- b. Both 1 and 2 are sufficient
- c. Only 1 is enough
- d. Either 1 or 2 is enough

82. The difference between $\frac{3}{8}$ and an other number is $\frac{1}{5}$. What is another number? (+1, -0.33)

- a. $\frac{8}{15}$
- b. $\frac{2}{3}$
- c. $\frac{3}{40}$
- d. $\frac{7}{40}$

83. Which country hosted the 2018 Commonwealth Games? (+1, -0.33)

- a. South Africa
- b. Australia

c. China

d. India

84. Who is the Chief Minister of Assam since August 2018? (+1, -0.33)

a. Arvind kejriwal

b. Biplab Deb

c. Nitish Kumar

d. Sarbananda Sonowal

85. The following table shows the passing percentage of the results of the four schools in the last four years. (+1, -0.33)

School Name	2012-13	2013-14	2014-15	2015-16
XYZ	78	69	81	92
ABC	61	72	84	96
PQR	81	92	85	97
TUV	92	69	72	95

Which school's performance is increasing every year?

a. TUV

b. XYZ

c. PQR

d. ABC

86. The ratio of sand and cement in a mixture is 7 : 1. How much cement should be added to the remaining 72 kg of this mixture, so that the resulting mixture has a ratio of 6 : 1? (+1, -0.33)

- a. 3 kg
- b. 1.5 kg
- c. 1 kg
- d. 2 kg

87. Where does the process of fertilization take place in the human body? (+1, -0.33)

- a. Uterus
- b. Fallopian tube
- c. Ovary
- d. Vagina

88. Which state of India is the leading producer of cotton? (+1, -0.33)

- a. Gujarat
- b. Maharashtra
- c. Telangana
- d. Goa

89. Select the most suitable option to solve the given equation. (+1, -0.33)

$$\frac{5}{13} + \frac{13}{5}$$

- a. $\frac{18}{65}$
- b. $\frac{65}{18}$
- c. $\frac{18}{18}$
- d. $2\frac{64}{65}$

90. Shahzar Rizby won gold in the men's 10m air pistol competition at the 2018 ISSF World Cup held in Mexico. He is from which Indian state? (+1, -0.33)

- a. Punjab
- b. Bihar
- c. Uttar Pradesh
- d. Arunachal Pradesh

91. Read the given statement and conclusions carefully and choose which of the conclusions logically follows the given statement. (+1, -0.33)

Statement:

We should develop our traditional weaving methods by promoting handicrafts.

Conclusions:

- I. There are various traditional weaving methods.
- II. Handicraft products are not affordable for the general public.

- a. No conclusion follows.

- b. Both conclusions follow.
- c. Only conclusion I follows
- d. Only conclusion II follows.

92. A quadratic equation has two origins $x = \frac{1}{11}$ and $x = \frac{-1}{9}$. How can the equation be written in the following way? (+1, -0.33)

- a. $(11x - 1)(9x - 1) = 0$
- b. $(11x - 1)(9x + 1) = 0$
- c. $(11x + 1)(9x - 1) = 0$
- d. $(11x + 1)(9x + 1) = 0$

93. Who is the director of the film "Padmavat" released in 2018? (+1, -0.33)

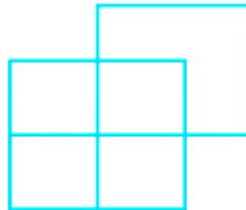
- a. Sanjay Leela Bhansali
- b. K. Vishwanath
- c. Rajkumar Hirani
- d. S. S. Rajamouli

94. The Irish diplomat and former director-general of the General Agreement on Tariffs and Trade (now, WTO) is which of the following personality? (+1, -0.33)

- a. Ken Rutherford
- b. Peter Sutherland

- c. Peter Gilmore
 - d. Kiefer Sutherland
-

95. Count the number of squares in the following figure. (+1, -0.33)



- a. 6
 - b. 7
 - c. 8
 - d. 25
-

96. Three of the four options below are related in a particular way. Choose an option that is different or mismatched from the others. (+1, -0.33)

- a. Tweet
 - b. Chat
 - c. Scream
 - d. Snake
-

97. Which of the following languages is spoken by most of the locals and is also known as Castellano? (+1, -0.33)

- a. Italian

- b. Spanish
- c. Portuguese
- d. Greek

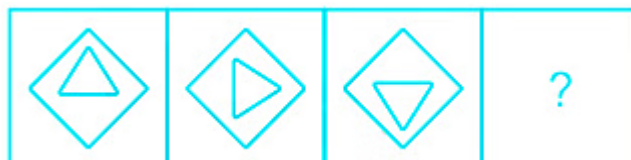
98. A cyclist covers the first three kilometers at an average speed of 8 km/h, the other two kilometers at 3 km/h and the last two kilometers at 2 km/h. What is the approximate average speed (in km/h) of the entire journey? (+1, -0.33)

- a. 3
- b. 2.4
- c. 3.43
- d. 3.8

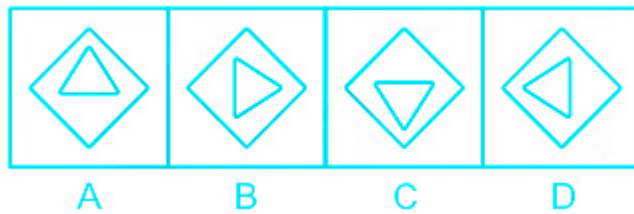
99. Force / Acceleration = (+1, -0.33)

- a. Momentum
- b. Speed
- c. Mass
- d. Pressure

100. Which answer figure will replace the question mark? (+1, -0.33)



Answer figures:



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

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Your Personal Exams Guide

Answers

1. Answer: b

Explanation:

Given:

Brazen can paint a wall in 12 days

Ballary can paint the wall in 21 days

Formula used:

If a person can complete the work in A days, then the person can complete $1/A$ work in 1 day.

Calculation:

Work completed by Brazen in 1 day = $1/12$

Work completed by Ballary in 1 day = $1/21$

Total work completed by them in 1 day = $1/12 + 1/21$

⇒ Total work completed by them in 2 days = $(7 + 4)/84$

⇒ Total work completed by them in 2 days = $11/84$

Total work completed by them in 7×2 days = 14 days = $77/84$

⇒ Remaining work = $1 - 77/84 = 7/84 = 1/12$

Brazen can do $1/12$ work in 1 day

Total time taken = $14 + 1 = 15$ days

∴ Total time taken is 15 days

2. Answer: d

Explanation:

Calculation:

11, 12, 13, 23, _____, 34, 19, 45, 23

It is forming an alternate series

Series 1 → 11, 13, _____, 19, 23

Series 2 → 12, 23, 34, 45

Series 1 → $11 + 2 = 13$, $13 + 4 = 17$, $17 + 2 = 19$, $19 + 4 = 23$

Series 2 → $12 + 11 = 23$, $23 + 11 = 34$, $34 + 11 = 45$

∴ The missing term is 17

3. Answer: d

Explanation: Your Personal Exams Guide

Concept used:

If the sum of digits of a number is a multiple of 9, then the number is divisible by 9.

Calculation:

Sum of digits

Option 1 → $29039 = 2 + 9 + 0 + 3 + 9 = 23$

Option 2 → $19239 = 1 + 9 + 2 + 3 + 9 = 24$

Option 3 → $17139 = 1 + 7 + 1 + 3 + 9 = 21$

Option 4 $\rightarrow 31239 = 3 + 1 + 2 + 3 + 9 = 18$

As, sum of digits of option 4 is divisible by 9

$\therefore 31239$ is divisible by 9

4. Answer: a

Explanation:

Given:

Principal (P) = Rs. 3000

Rate of interest = 30%

Time = 1 year

Formula used:

$$\text{Amount} = P \times \left(1 + \frac{R}{100}\right)^n$$

Calculation:

As it is compounded every 4 months i.e. in a year interest should be counted 3 times, so $R = 30/3 = 10\%$

And n will be $1 \times 3 = 3$

$$A = 3000 \times \left[1 + \frac{(10)}{100}\right]^3$$

$$\Rightarrow A = 3000 \times \left(\frac{1331}{1000}\right)$$

$$\Rightarrow A = 3993$$

\therefore Amount is Rs. 3993

5. Answer: a

Explanation:

The logic followed here is:

No. of Odd days	Simple Year	Leap Year
	$365 \div 7 = 52 \text{ weeks} + 1 \text{ odd day}$	$366 \div 7 = 52 \text{ weeks} + 2 \text{ odd day}$

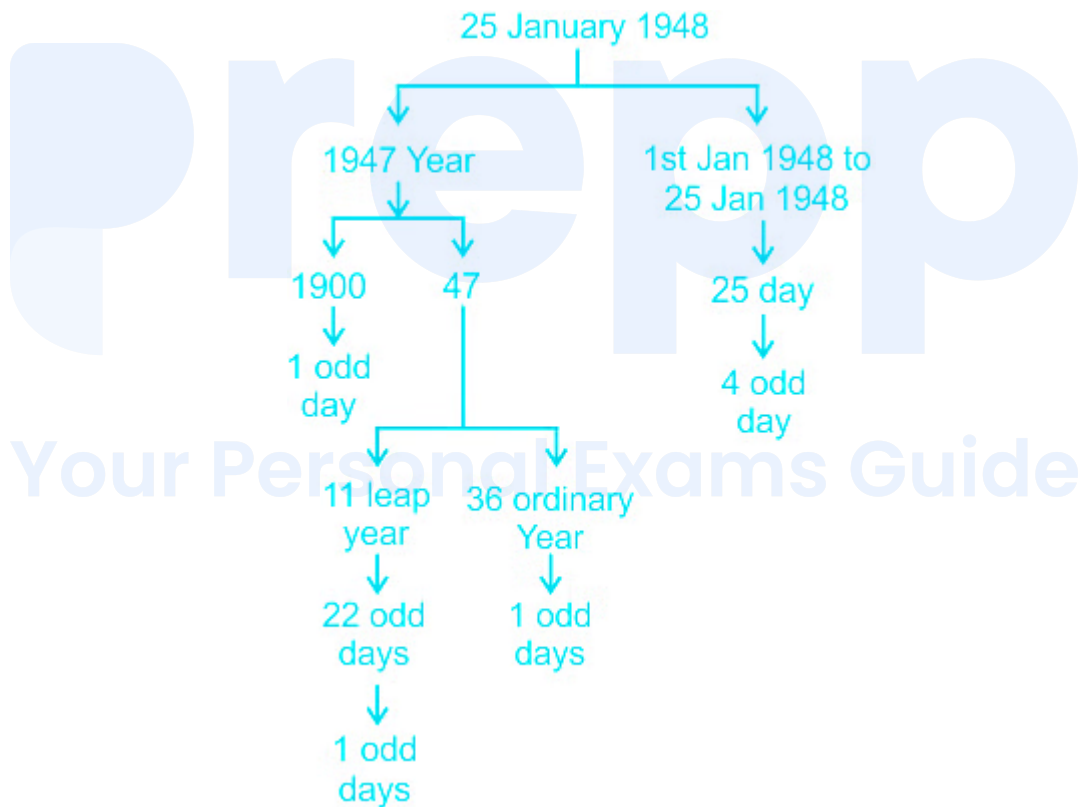
Years	No. of odd days
100 years	5
200 years	3
300 years	1
400 years	0

Note : Multiple of 400 years i.e. 800, 1200, 1600, 2000 have 0 odd days .

Calculating leap year: For Finding the number of leap year (1 – 99) years, divide the number of years by 4 and the quotient will be the number of leap years.

Code for weekdays:

No. of odd days	Day
0	Sunday
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday



Total odd days = 1 + 1 + 1 + 4 = 7 days = 0 odd day.

'0' is the code for "Sunday".

Hence, the correct answer is "Sunday".

★ Key Points

- Take the last two digits of the year.
- Divide by 4, discarding any remainder.
- Add the day of the month.
- Add the month's key value: JFM AMJ JAS OND 144 025 036 146
- Subtract 1 for January or February of a leap year.
- For a Gregorian date, add 0 for 1900's, 6 for 2000's, 4 for 1700's, 2 for 1800's; for other years, add or subtract multiples of 400.
- For a Julian date, add 1 for 1700's, and 1 for every additional century you go back.
- Add the last two digits of the year.
- Divide by 7 and take the remainder.

6. Answer: c

Explanation:

The correct answer is 14.

★ Key Points

- **Child Labour (Prohibition and Regulation) Act** was enacted by the Ministry of Law and Justice on 30th July 2016.
- This Act **amended** the Child Labour (Prohibition and Regulation) Act, **1986**.
- **According to this Act:**
 - No child shall be employed or permitted to work in any occupation or process.
 - **Criteria of a child** – A person **below the age of 14 yrs** .

★ Additional Information

- **Nothing in Act shall apply where the child:**
 - Helps his family or family enterprise, which is other than any hazardous occupations or processes set forth in the Schedule, after his school hours or during vacations.

- Works as an artist in the audio-visual entertainment industry, including advertisement, films, television serials or any such other entertainment or sports activities except the circus.

★ Important Points

- Article 24 – Prohibition of child labour.

7. Answer: c

Explanation:

Concept used:

Basic trigonometric functions like:-

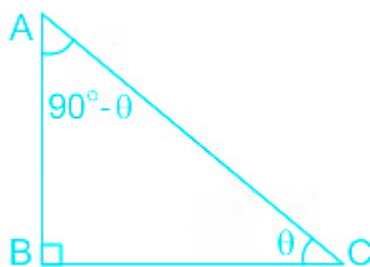
$$\sin\theta = P/H$$

$$\cos\theta = B/H$$

Where P is perpendicular, B is Base and H is Hypotenuse

Calculation:

Let us consider the triangle below, having angle θ between BC and AC



When we take angle θ , P is AB, B is BC and H is AC, and

When we take angle $(90^\circ - \theta)$, P is BC, B is AB and H is AC

$$\sin(90^\circ - \theta) = P/H = BC/AC$$

$$\cos\theta = B/H = BC/AC$$

$\therefore \sin(90^\circ - \theta)$ is equal to $\cos\theta$

8. Answer: a

Explanation:

Concept used:

A given natural number can be expressed as $2^a \cdot 3^b \cdot 5^c \cdot 7^d \dots$ and so on

Where $a, b, c, d \dots$ and so on are whole numbers

Total number of factors = $(a + 1) \times (b + 1) \times (c + 1) \times (d + 1) \dots$ and so on

Total number of even factors = $a \times (b + 1) \times (c + 1) \times (d + 1) \dots$ and so on

Calculation:

Total number of even factors = $8 \times (2 + 1) \times (3 + 1) \times (5 + 1)$

\therefore Total numbers of even factors is 576

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9. Answer: c

Explanation:

The correct answer is 44%.

★ Key Points

- **Momentum** can be defined as the **product** of the **mass of a particle** and its **velocity**.
- It is denoted by **p**, SI unit is **(Kg-m)/s** and Dimension is **MLT⁻¹**.

- Newton's second law defines a **force** to be equal to the **change in momentum** with a change in time.

★ Additional Information

If Initial Momentum = p_i , Mass of object = m , and velocity of object = v

Kinetic Energy, $K.E_i = \frac{1}{2} (mv^2)$

$$\frac{1}{2} (mv^2) = (\frac{1}{2} (mv^2))/m = (\frac{1}{2}p^2)/m$$

Now, p increases by 20%, so new momentum,

$$p_f = (p + 20\% \text{ of } p) = p + p/5 = \frac{6p}{5}.$$

New Kinetic Energy = $(\frac{1}{2}p_f^2)/m$.

$$\text{So, } K.E_f = (\frac{1}{2} * (\frac{6p}{5})^2)/m = \frac{36}{25} * (\frac{1}{2}p^2)/m.$$

$$\% \text{ increase in K.E} = (\text{Change in K.E} / \text{Initial K.E}) * 100$$

$$= ((\frac{36}{25} * (\frac{1}{2}p^2)/m - (\frac{1}{2}p^2)/m) / (\frac{1}{2}p^2)/m) * 100.$$

$$\text{So, \% increase in K.E} = (11/25) * 100 = \mathbf{44\%}.$$

★ Mistake Points

$$K.E = \frac{1}{2} (mv^2) = \frac{1}{2} (mv) * v.$$

$$K.E = \frac{1}{2}(pv), \text{ ----- } 1$$

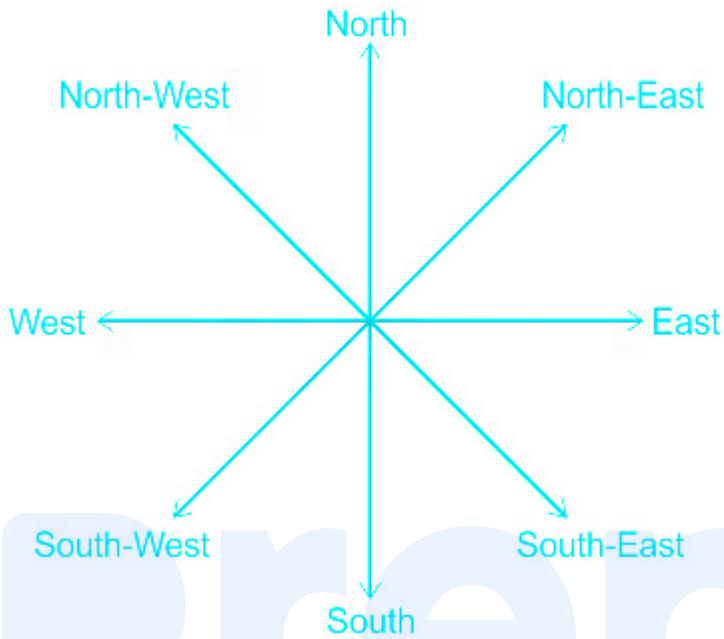
But the above equation is **wrong to implement** in this question.

- Since $p = m*v$, where **mass is always constant**, and **velocity varies**, which means momentum varies because of the velocity.
- In **eqn. 1**, **v is left out**, and hence the **result** thus produced **will be wrong**.

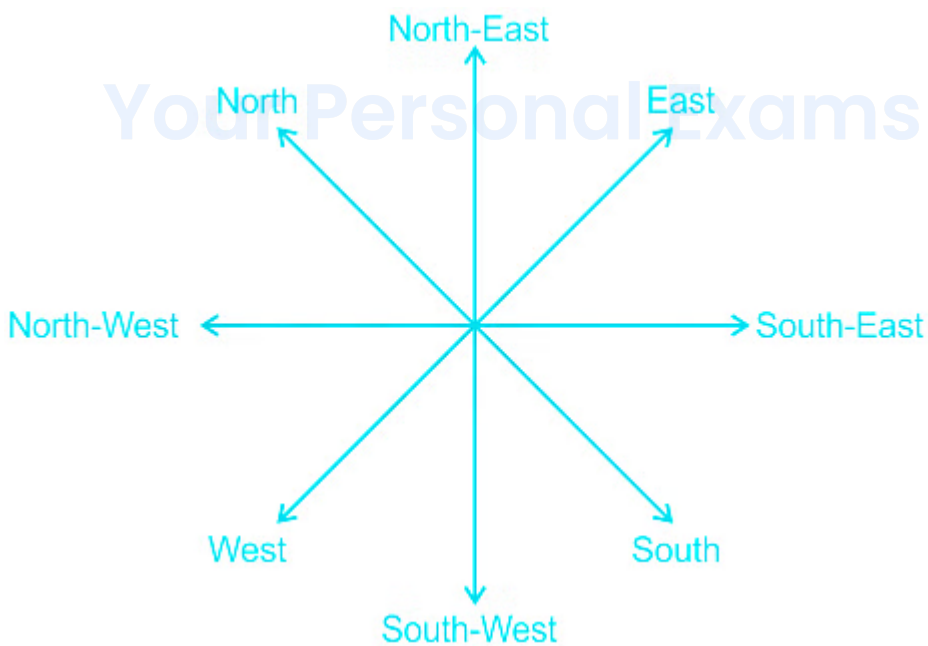
10. Answer: b

Explanation:

According to given conditions,



If North-West is called North
then,



West is called North-West.

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

11. Answer: d

Explanation:

According to given conditions,



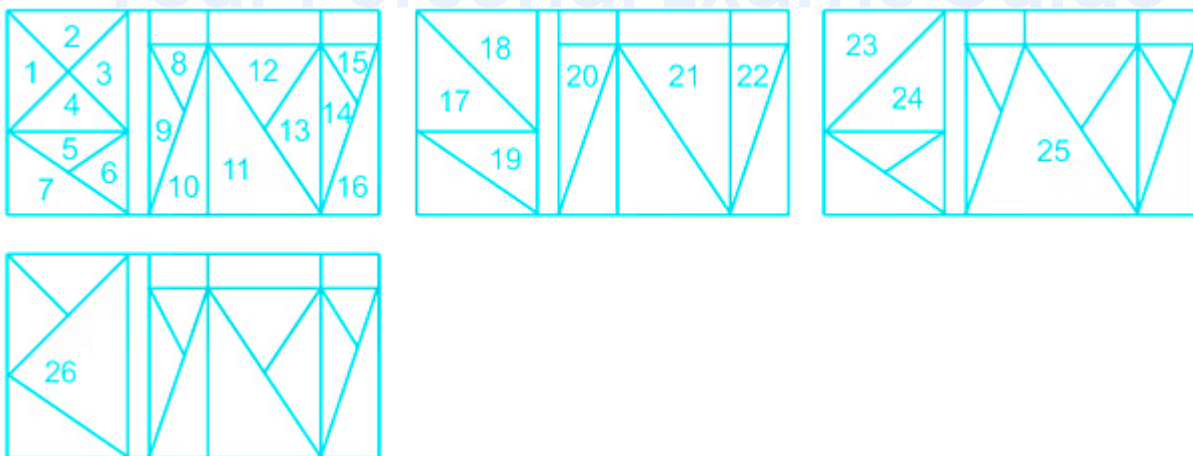
So 15th form the left side is L

Hence, 'L' is the correct answer.

12. Answer: a

Explanation:

The number of triangles in the figure is shown below:

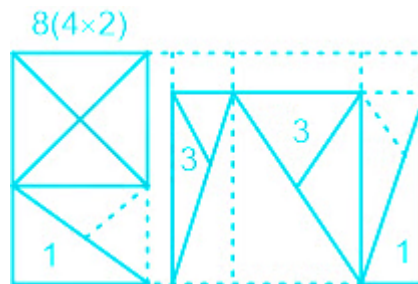


Hence, '27' is the correct answer.

★ Shortcut Trick

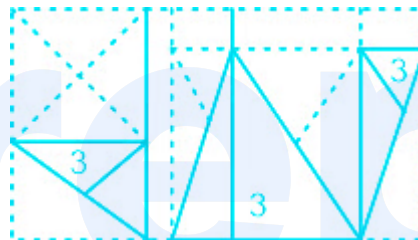
The pattern follows here is:

Figure 1:



Number of triangles = $8 + 1 + 3 + 3 + 1 = 16$

Figure 2:



Number of triangles = $3 + 3 + 3 = 9$

Figure 3:



Number of triangles = $1 + 1 = 2$

Thus **total number of triangles** = $16 + 9 + 2 = 27$

Hence, the correct answer is "27".

13. Answer: c

Explanation:

The correct answer is Tea.

★ Key Points

- Tea is a herb, that is grown in vegetable gardens or fields.
- Horticulture is the study of growing flowers, fruits, and vegetables.
- Major Indian horticultural products:
 - Apple, Guava, Grapes, Banana, Litchi, etc.
- India is the second-largest producer of fruits and vegetables in the world.

14. Answer: b

Explanation:

(I) People are getting fake calls for stealing bank account details

It is implicit as the statement given by the Managing Director of the Bank is to inform its customers about such fake calls taking place for stealing bank account details are taking place.

(II) Bank officials call customers to change ATM PIN

It is not implicit to the statement.

Hence, only I is implicit.

15. Answer: c

Explanation:

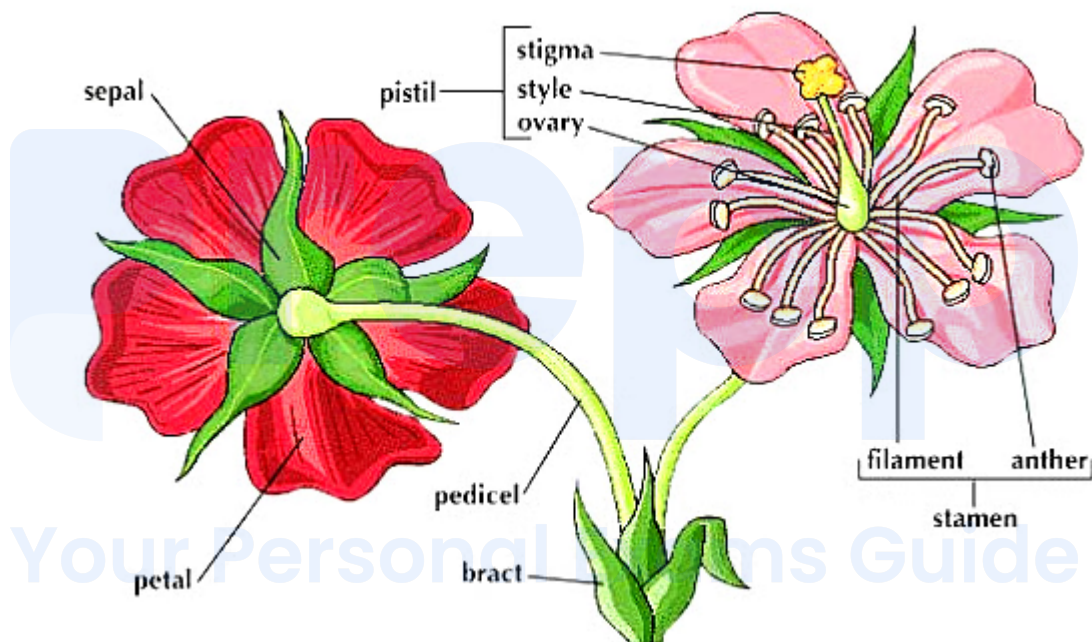
The correct answer is Anthems and Filaments.

★ Key Points

- The **male reproductive organ** of the flower is known as the **stamen**.
- It is having two parts:
 - **Anthers** – The part of the stamen where pollen is produced.
 - **Filaments** – It is a stalk-like structure that connects the base of the flower with anther.

★ Additional Information

- **Ovary** – It is the enlarged basal portion of the pistil, where ovules are produced.
- **Pistil** – It is the female reproductive part of the flower.
- **Stigma** – It is the part of the pistil where pollen germinates.



16. Answer: d

Explanation:

Given:

Speed of train = 66 km/hr

Length of bridge = 465 m

Time taken to cross the bridge = 33 sec

Formula used:

Distance = Speed \times Time

Calculation:

Let the length of the train = x m

Distance covered by the train = length of train + length of bridge

\Rightarrow Distance = $(x + 465)$ m

As, Distance = Speed \times Time

$x + 465 = [66 \times (5/18)] \times 33$

$\Rightarrow x + 465 = 605$

$\Rightarrow x = 605 - 465 = 140$ m

\therefore Length of the train is 140 m

17. Answer: a

Explanation:

The correct answer is Roasting.

★ Key Points

- **Roasting** is a process of metallurgy where ore is converted into its oxide.
- It involves the **heating of ores above** their **melting point** in the **presence of excess air**.
- **During the process** of roasting **moisture and non-metallic impurities** in the form of **volatile gases** are **removed**.

★ Additional Information

- **Calcination** – The **process of heating and converting ore** into an oxide. The moisture is also removed from the ore in this process.
- **Corrosion** – The natural process that **converts refined metals into more stable compounds** such as metal oxides, metal sulfides, or metal hydroxides.
- **Extraction** – It is the process of taking out metals from their ores through mining.

18. Answer: a

Explanation:

Calculation:

$$[(100 - 2) \div 2] \times 10 = 59$$

Checking options

Option 1

$$[(100 - 2) \div 2] + 10 = (98/2) + 10 = 59$$

Option 2

$$[(100 - 2) \times 2] \div 10 = 19.6$$

Option 3

$$[(100 + 2) \times 2] \times 10 = 2040$$

Option 4

$$[(100 + 2) \div 2] \div 10 = 5.1$$

\therefore Option 1 is correct

19. Answer: a

Explanation:

The correct answer is Butene: CH₃ - CH₂ - CH = CH₂

★ Key Points

- Butene Molecular Formula is **C₄H₈** or **CH₃CH₂CH=CH₂** & Molecular Weight is **56.11 g/mol**.
- Butene is a colourless gas.
- It is used for the production of a wide variety of chemicals in the gasoline and rubber processing areas.

★ Important Points

- **Propene** is an **alkene** that is propane with a double bond at position 1. It is a gas molecular entity.
- Propene **molecular formula** **C₃H₆** or **CH₂CHCH₃** or **CH₃CHCH₂** & molecular weight **42.08 g/mol**.
- **Ethane** appears as a colourless odourless gas. It is easily ignited. The vapours are heavier than air. It can asphyxiate by the displacement of air.
- Molecular formula **C₂H₆** or **CH₃CH₃** & molecular weight is **30.07 g/mol**.

20. Answer: d

Explanation:

The correct answer is Alessia Cara.

★ Key Points

- **Alessia Cara** wins Best New Artist at the **60th Annual GRAMMY Awards**.

★ Important Points

- **Ed Sheeran** wins for **Best Pop Solo Performance** for "Shape Of You" at the 60th Annual GRAMMY Awards.
- **Kendrick Lamar** wins **Best Rap Album** for **DAMN** at the 60th Annual GRAMMY Awards.

★ Additional Information

- Dave Chappelle wins **Best Comedy Album** for **The Age of Spin** and **Deep in the Heart of Texas** at the 60th Annual GRAMMY Awards.
- Chris Stapleton wins **Best Country Album** for **From A Room Volume 1** at the 60th Annual GRAMMY Awards.
- Bruno Mars wins **Song Of The Year** for " That's What I Like " at the 60th Annual GRAMMY Awards.
- Bruno Mars wins **Album of the Year** for **24K Magic** at the 60th Annual GRAMMY Awards.

21. Answer: a

Explanation:

The correct answer is Iron nail.

★ Key Points

- The Density of the iron nail is **greater than the density of water** .
- The density of water is not really 1 g/ml, but rather a **bit less at 0.9998395 g/ml** at 4.0° Celsius (39.2° Fahrenheit).

★ Important Points

- As water is warmed from the freezing point of 0 to 4 °C. It contracts and becomes denser. This initial increase in density takes place because at 0°C a portion of the water consists of open-structured molecular arrangements similar to those of ice crystals.
- **Ice** is **less dense** than water.
- **The cork's** density is 0.24 g/cm^3 , and the density of water is 1.00 g/cm^3 . So the cork will float.

22. Answer: d

Explanation:

Given:

The number is 35721.

We have to find the square root of the number.

Calculation:

$$\begin{array}{r}
 \overline{35721} \mid 189 \\
 \underline{1} \\
 28 \overline{) 257} \\
 \underline{224} \\
 369 \overline{) 3321} \\
 \underline{3321} \\
 0
 \end{array}$$

$$\sqrt{35721} = 189$$

\therefore The square root of 35721 is 189.

★ Alternate Method

Concept used:

Factorization method

$$\begin{array}{r}
 3 \overline{) 35721} \\
 \underline{3} \\
 3 \overline{) 11907} \\
 \underline{3} \\
 3 \overline{) 3969} \\
 \underline{3} \\
 3 \overline{) 1323} \\
 \underline{3} \\
 3 \overline{) 441} \\
 \underline{3} \\
 3 \overline{) 147} \\
 \underline{3} \\
 7 \overline{) 49} \\
 \underline{7} \\
 7
 \end{array}$$

$$35721 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 7 \times 7$$

$$\Rightarrow 35721 = 3^2 \times 3^2 \times 3^2 \times 7^2$$

$$\sqrt{35721} = \sqrt{(3 \times 3 \times 3 \times 7 \times 7)}$$

$$\Rightarrow \sqrt{35721} = 3 \times 3 \times 7$$

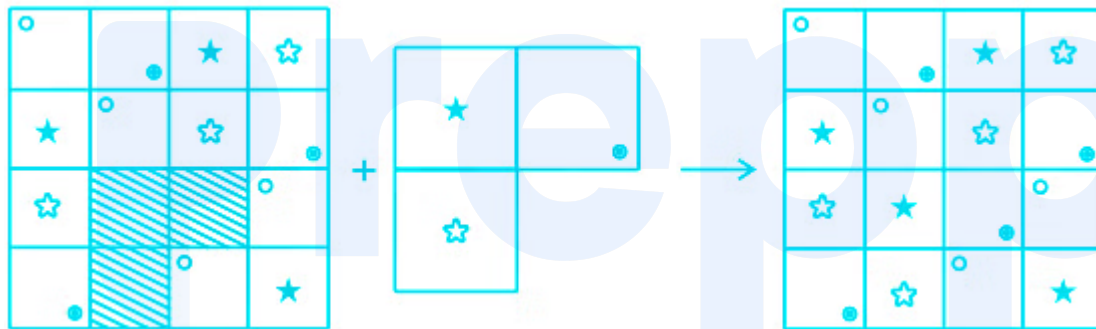
$$\Rightarrow \sqrt{35721} = 189$$

\therefore The square root of 35721 is 189.

23. Answer: d

Explanation:

The shaded part is replaced by,



Hence, the figure in option 4 is the correct answer.

24. Answer: a

Explanation:

The time at which the mirror image of the clock shows the time of 3:00 AM can find out by subtracting 3 : 00 AM from 11 : 60.

$$\text{So, } 11 : 60 - 3 : 00 = 8 : 60$$

$$= 9 : 00 \text{ AM}$$

At 9:00 AM the mirror image of the clock show the time of 3:00 AM.

Hence, '9 : 00 AM' is the correct answer

25. Answer: d

Explanation:

The correct answer is Lanthanoid.

★ Key Points

- The **lanthanide series** includes **elements 58 to 71**, which fill their 4f sublevel progressively.
- Lanthanides have a different chemistry from **transition metals** because their 4f orbitals are shielded from the atom's environment.
- Lanthanide contraction progressive **decrease in the radii of atoms** of the **lanthanide elements** as the **atomic number increases**, evident in various physical properties of the elements and their compounds.

★ Important Points

- **Actinides** are elements 89 to 103 and fill their 5f sublevel progressively, Actinides are typical metals and have properties of both the d-block and the f-block elements, but they are also radioactive.
- Actinide any of the **14 radioactive elements** of the periodic table that are positioned under the lanthanides.
- **Halogen**, any of the six nonmetallic elements that constitute Group 17 (Group VIIa) of the periodic table. The halogen elements are fluorine (F), chlorine (Cl), bromine (Br), iodine (I), astatine (At), and tennessine (Ts).
- **Transition metal**, any of various chemical elements that have valence electrons i.e., electrons that can participate in the formation of chemical bonds in two shells instead of only one.

Table: Modern Periodic table

The zig zag line separates the metals from the non metals

Legend:

- Alkali metals
- Alkaline Earth Metals
- Halogens
- Nobel gases

GROUP NUMBER

PERIODS

1	2											13	14	15	16	17	18
1	2											13	14	15	16	17	18
3	4											5	6	7	8	9	10
11	12											13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
87	88	89	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118

Transition Metals

GROUP NUMBER

*Lanthanoides 6

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

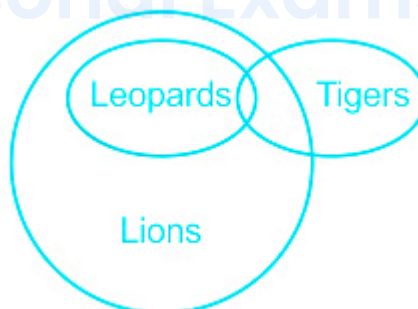
**Actinoides 7

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

26. Answer: b

Explanation:

The least possible venn diagram is:



I. Some tigers are lions. → True (It is definitely because all leopards are lions and Some tigers are leopards.)

II. No lion is tiger → False (It is not definite)

Hence, only I follows.

27. Answer: c

Explanation:

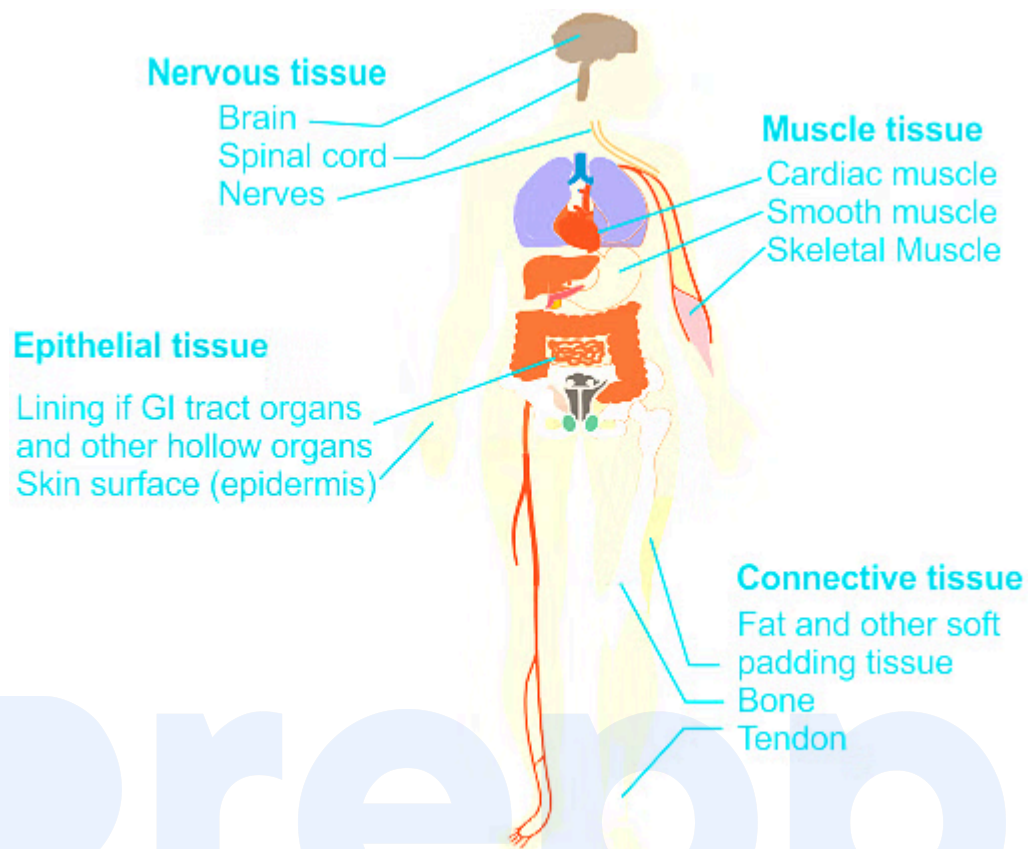
The correct answer is Parenchyma.

★ Key Points

- Parenchyma:
 - These are **living polygonal cells** with a **big central vacuole & intercellular spaces amidst them**.
 - **Parenchymatous cells** are responsible to **create ground pith & tissue**.
 - It comprising of **chloroplasts** and that's why it is termed **chlorenchyma** & it helps in **photosynthesis**.
 - **Parenchyma** which comprises the **big air voids** is called **aerenchyma**. '**Buoyancy**' is the main purpose of **aerenchyma**.
 - Some of these cells perform as storage chambers for starch in fruits & vegetables.

★ Important Points

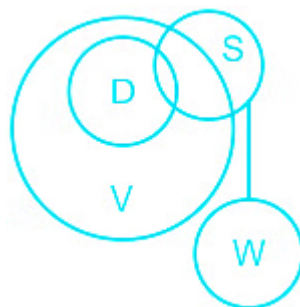
- **Epithelial tissues** are widespread throughout the body. They form the **covering of all body surfaces**, line body cavities, & hollow organs, and are the major tissue in glands. They perform a variety of functions that include protection, secretion, absorption, excretion, filtration, diffusion, and sensory reception.
- **Muscle tissue** is composed of cells that have the special ability to **shorten or contract in order to produce movement of the body parts**. The tissue is highly cellular and is well supplied with blood vessels.
- **Connective tissue**, group of tissues in the body that **maintains the form of the body** and its organs and provides cohesion and internal support.



28. Answer: c

Explanation:

The least possible Venn diagram is:



I. Some W is not D. → False (It can be possible but it is not definite)

II. Some V are S. → True (It is definite)

III. Some D are S. \rightarrow True (It is definite)

Hence, only II and III follow.

29. Answer: b

Explanation:

The pattern followed here is:

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

According to the alphabetical positions of the letters,

$$\begin{array}{l}
 A \xrightarrow{+6} G \xrightarrow{+6} M \xrightarrow{+6} S \\
 D \xrightarrow{+6} J \xrightarrow{+6} P \xrightarrow{+6} V \\
 4 \xrightarrow{+6} 10 \xrightarrow{+6} 16 \xrightarrow{+6} 22
 \end{array}$$

Hence, 'SV22' is the correct answer.

30. Answer: a

Explanation:

The correct answer is Divorce.

★ Key Points

- This Act, in substance, declared the triple talaq, ie talaq-e-biddat or any other similar form of talaq, illegal.

- Any Muslim husband who pronounces such talaq to his wife can suffer imprisonment for a term of three years and also be liable for a fine.
- This Act may be called the **Muslim Women (Protection of Rights on Marriage) Act, 2019**.

★ Important Points

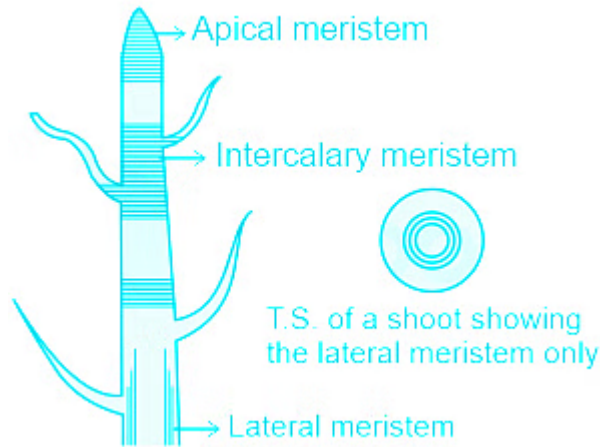
- **Dowry Prohibition Act**, Indian law, enacted on **May 1, 1961**, intended to prevent the giving or receiving of a dowry.
- The **Child Marriage Restraint Act, 1929** being a male above eighteen years of age and below twenty-one, contracts a child marriage shall be punishable with simple imprisonment.

31. Answer: a

Explanation:

★ Key Points

- Meristems or meristematic tissue is the type of plant tissue that has the **capability of cell division**.
- It is composed of **undifferentiated cells**.
- They help in **increasing the length and thickness** of a plant.
- According to their **position and function** they are divided into 3 types:
 - **Apical meristem** - They are present at the tips of roots and stems. They help in **increasing the length** of the plant.
 - **Lateral meristem** - They help in **increasing the thickness** and girth of a plant. They are also called secondary meristems because they occur in the mature regions of roots and shoots.
 - **Intercalary meristem** - They are found at the base of leaves and internodes. They help in the **elongation of internodes**.
- Lateral meristems also helps in forming the secondary tissues like cambium.



32. Answer: c

Explanation:

The correct answer is South Korea.

★ Key Points

- A **ski** is a narrow strip of semi-rigid material worn underfoot to glide over snow.
- A **humanoid robot** is a robot with its body shape built to resemble the human body.
- The **robots** are equipped with **sensors**, **batteries**, **artificial intelligence**, and **deep learning algorithms** that allowed them to move on their own.

★ Additional Information

- **Uses of robots :**
 - Research in the Scientific field.
 - Personal Assistance
 - Entertainers
 - Space Exploration
- **Sophia**, first humanoid robot to get citizenship of a country. Sophia is a **Saudi Arabian citizen**.

33. Answer: a

Explanation:

The correct answer is 1 : 3.

★ Key Points

Explanation :

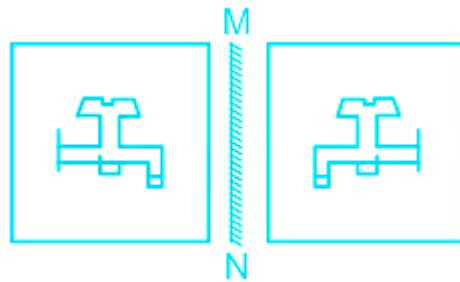
- The relation between Linear momentum and KE is:
 - $P = \sqrt{2mKE}$
- Here
 - m= Mass of the body
 - KE = kinetic Energy
- Given Data:
 - m₁= mass of first body i.e= m (Given)
 - m₂= mass of second body i.e= 9m (Given)
- Let us assume:
 - KE₁ = kinetic Energy of the first body
 - KE₂ = kinetic Energy of the second body
- The ratio of linear momentum:
 - $P_1/P_2 = \sqrt{2m_1KE_1}/\sqrt{2m_2KE_2}$
 - $P_1/P_2 = \sqrt{m_1}/\sqrt{m_2}$
 - $P_1/P_2 = 1/3$

Hence, The ratio of their linear momentum is 1:3.

34. Answer: c

Explanation:

The mirror image of the following figure is shown below:



Hence, 'option 3' is the correct answer.

35. Answer: b

Explanation:

According to the alphabetical positions of the letters,

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

The pattern followed here is:

P
↓ +1
Q

 L
↓ +1
M

 A
↓ +1
B

 N
↓ +1
O

 T
↓ +1
U

Similarly,

T
↓ +1
U

 O
↓ +1
P

 Y
↓ +1
Z

 O
↓ +1
P

 T
↓ +1
U

 A
↓ +1
B

Hence, 'UPZPUB' is the correct answer.

36. Answer: b

Explanation:

Given:

We have to find the number from the given options which have the square root rational.

Concept:

Unit digit and option trial method

Calculation:

We know that,

$$1^2 = 1$$

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$7^2 = 49$$

$$8^2 = 64$$

$$9^2 = 81$$

$$10^2 = 100$$

$$11^2 = 121$$

$$12^2 = 144 \dots$$

and so on.

From the above, we can conclude that the unit digit of the square of a rational number will be one of 0, 1, 4, 5, 6, and 9

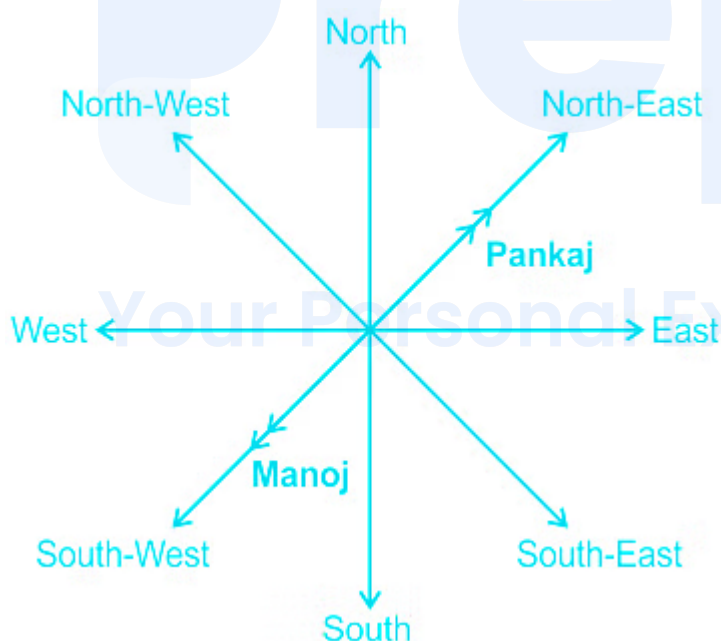
Among the given options only 34225 has the unit digit which satisfies the condition.

\therefore Our desire number is 34225 which have the square root rational.

37. Answer: d

Explanation:

According to given conditions,



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

38. Answer: c

Explanation:

The correct answer is $t^{3/2}$

- Suppose a body is moved along a straight line by a machine delivering a constant power P , and the distance moved by the body is S .
- Power, $P = F \cdot v$
- Force, $F = ma$
 - where,
 - **velocity**, $v = \frac{S}{t}$
 - **acceleration**, $a = \frac{S}{t^2}$
 - $m = \text{mass}$
- **Calculation:**
 - $P = mav$
 - $P = m \cdot \frac{S}{t} \cdot \frac{S}{t^2}$
 - $S^2 = \frac{Pt^3}{m}$
- hence from the above equation
- $S^2 \propto t^3$
- $S \propto t^{3/2}$
- Hence option 3 is correct.

Your Personal Exams Guide

39. Answer: b

Explanation:

All options except '2' are plane 2-D figures, while option 2 is a 3-D figure.

Hence, 'option 2' is the odd one out.

40. Answer: a

Explanation:

The correct answer is Electronegativity.

★ Important Points

- The concept of **electronegativity** was first proposed by **Linus Pauling** in 1932.
- **Linus Pauling** explained that the covalent bond between two different atoms (A–B) is stronger than the average of the A–A and the B–B bonds.

★ Key Points

- The **electronegativity** of an atom is affected by both its atomic number and the distance that its valence electrons reside from the charged nuclei.
- **Fluorine** is the most electronegative element.
- **Cesium** is the least electronegative element.

★ Additional Information

Ionization Energy	Ionization energy is the minimum amount of energy required to remove the most loosely bound electron of an isolated neutral gaseous atom or molecule.
Quantum Energy	According to quantum theory, energy is held to be emitted and absorbed in tiny, discrete amounts.

Your Personal Exams Guide

41. Answer: b

Explanation:

The correct answer is 44u.

The **atomic number** of **Carbon** is 6 and its **atomic mass** is 12.0107u .

The **atomic number** of **Oxygen** is 8 and its **atomic mass** is 15.999u .

So, CO₂ contains 1 carbon molecule and 2 oxygen molecules.

Taking atomic masses as whole

Then, $1 \times 12 + 2 \times 16 = 44$

Hence, the relative molecular mass of CO_2 is 44u.

★ Key Points

- The **molecular mass** is the mass of a given molecule.
- It is measured in **daltons (Da or u)**.

42. Answer: a

Explanation:

The correct answer is Medulla.

★ Key Points

- The **medulla** is the lowest part of the brain and the lowest portion of the brainstem.
- The **medulla** is connected by the pons to the midbrain and is continuous posteriorly with the spinal cord.
- The **medulla** plays a critical role in transmitting signals between the spinal cord and the higher parts of the brain and in controlling autonomic activities, such as heartbeat and respiration.

★ Additional Information

<u>Parts of Brain</u>	<u>Functions</u>
Cerebrum	Sensory processing, Language, and communication, Learning and memory
Cerebellum	Posture, balance, coordination, and speech, resulting in smooth and balanced muscular activity.
Brain Stem	Cardiac and respiratory functions.

43. Answer: d

Explanation:

Given:

The ratio of the present ages of X and Y is 3 : 8

The ratio of the present ages of Y and Z is 4 : 5

Two years ago the age ratio of X and Y was 1 : 3

Concept Used:

Concept of ratio and proportion

Calculation :

Let, the present age of X and Y be $3p$ and $8p$ respectively. [Where p is a constant]

Two years ago the age of X was $(3p - 2)$

Two years ago the age of Y was $(8p - 2)$

Accordingly,

$$\frac{(3p-2)}{(8p-2)} = \frac{1}{3}$$

$$\Rightarrow 3 \times (3p - 2) = (8p - 2)$$

$$\Rightarrow 9p - 6 = 8p - 2$$

$$\Rightarrow 9p - 8p = -2 + 6$$

$$\Rightarrow p = 4$$

The present age of X is $(3 \times 4) = 12$ years

The present age of Y is $(8 \times 4) = 32$ years

The ratio of the present ages of Y and Z is 4 : 5

Let, the present age of Y and Z are $4q$ and $5q$ respectively. [Where q is a constant]

Accordingly,

$$4q = 32$$

$$\Rightarrow q = 8$$

The present age of Z is $(5 \times 8) = 40$ years

Sum of their present age is $(12 + 32 + 40) = 84$ years

\therefore The sum of the present ages of the three is 84 years.

44. Answer: c

Explanation:

Given:

The numerical value of the area of a square is equal to half the numerical value of each of its diagonals.

Concept Used:

If the length of the sides of a square is a then the area of the square is a^2 and the length of the diagonal of the square is $(a\sqrt{2})$

Calculation:

Let, the length of the side of the square is a unit

Area of the square is a^2 square unit

Length of the diagonal of the square is $\sqrt{2}a$ unit

accordingly,

$$a^2 = (1/2)\sqrt{2}a$$

$$\Rightarrow a^2 = a/\sqrt{2}$$

$$\Rightarrow a = (1/\sqrt{2})$$

The length of the diagonal is $\{\sqrt{2} \times (1/\sqrt{2})\}$

$$\Rightarrow 1$$

\therefore The numerical value of diagonal is 1.

45. Answer: a

Explanation:

The correct answer is Sodium Hydrogen Carbonate.

★ Important Points

- **Sodium Hydrogen Carbonate** is commonly known as **Baking Soda**.
- The chemical name of **Sodium Hydrogen Carbonate** is NaHCO_3 .
- It is also called **Sodium Bicarbonate**.

★ Key Points

- It is a salt composed of a **sodium cation (Na^+)** and a **bicarbonate anion (HCO_3^-)**.
- It is a **crystalline solid** and white in color.
- **Uses of Sodium Hydrogen Carbonate**.
 - Cooking and Baking
 - Fungicide and Pest control
 - Neutralization of acids
 - Used as an antacid for acid indigestion

★ Additional Information

<u>Compound name</u>	<u>Chemical formula</u>
Ammonium Carbonate	NH_4HCO_3
Sodium Carbonate	Na_2CO_3
Ammonium Chloride	NH_4Cl_2

46. Answer: d

Explanation:

Given:

The length of the arms of a rhombus is 16 cm and 12 cm.

Concept Used:

If the length of the diagonals of a rhombus are d_1 and d_2 then the sides of the rhombus is $(1/2) \times \sqrt{(d_1^2 + d_2^2)}$

The perimeter of a rhombus is $(4 \times \text{Length of the side of the rhombus})$

Calculation:

Here $d_1 = 16$ cm

and $d_2 = 12$ cm

The length of the sides of the rhombus is $(1/2) \times \sqrt{(12^2 + 16^2)}$

$$\Rightarrow (1/2) \times \sqrt{(144 + 256)}$$

$$\Rightarrow (1/2) \times 20$$

$$\Rightarrow 10$$

The perimeter of the rhombus is $4 \times 10 = 40$ cm

∴ The perimeter of the rhombus is 40 cm.

★ Confusion Points

Length of arms means the length of diagonals.

47. Answer: d

Explanation:

The correct answer is CaO.

★ Important Points

- Compound name- **Calcium Oxide**.
- It is also known as **quick lime** or **burnt lime** .

★ Key Points

- **Calcium Oxide** is one of the oldest chemicals known to humans.
- **Properties of Calcium Oxide** .
 - It is an amorphous solid.
 - It has a melting point of 2572°C.
 - It is a very stable compound and withstands high temperatures.
- It is prepared from Calcium Carbonate.
 - $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- **Uses of Calcium Oxide** .
 - It is extensively used for medicinal purposes and insecticides.
 - It is used in the manufacturing of cement, paper, and high-grade steel.
 - It is used as a reagent in laboratories for dehydration, precipitation reaction, etc.

★ Additional Information

CaCO ₃	Compound name- Calcium Carbonate Uses- Cement and Steel manufacturing, Healthcare, Plastic and rubber manufacturing.
CaCl ₂	Compound name- Calcium Chloride Uses- Production of activated charcoal, the electrolyte in sports drinks, deicing.
Ca(OH) ₂	Compound name- Calcium Hydroxide (slaked lime) Uses- paper production, food processing, sewage treatment, construction.

48. Answer: d

Explanation:

In the given series, sign increased by one and after two-step sign gets opposite to the next term come in the series is '>>'.

Hence, '>>' is the correct answer.

49. Answer: c

Explanation:

The correct answer is There is no attraction force between particles of matter.

★ Important Points

- In a **Solid** , the attractive forces keep the particles together tightly enough so that the particles do not move past each other.
- In a **Liquid** , particles will flow or glide over one another, but stay toward the bottom of the container.
- In a **Gas** , particles are in continual straight-line motion.

★ Key Points

- Anything that takes space is called **matter**.
- Generally, we consider three states of matter.
 - Solid
 - Liquid
 - Gas

★ Additional Information

<u>Solid</u>	<u>Liquid</u>	<u>Gas</u>
has definite shape and volume.	has a definite volume but no definite shape	has no definite volume or shape
The particles are arranged close together and move very little by vibrating in place.	They take on the shape of their container.	The particles take on the shape of their container
When heated can turn into a liquid.	When heated can turn into gas. When cooled can turn into solid.	gas can be liquified.

50. Answer: c

Explanation:

The correct answer is M – Magnification, h_i – Height of reflection, h_o – Height of object.

★ Key Points

Magnification equation:

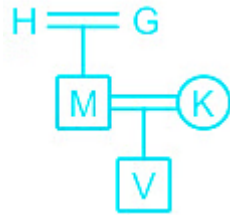
- $M = H_i/H_o = -D_i/D_o$
 - where M is the magnification
 - H_i is the height of the image
 - H_o is the height of the object,
 - D_i is the distance from the lens to the image and
 - D_o is the distance of the object to the lens.
 - The minus sign signifies the fact that the image will be inverted.

51. Answer: b

Explanation:

According to given conditions,

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



H and G are Grandmother-Grandfather of V.

Hence, 'Grandmother-Grandfather' is the correct answer.

52. Answer: a

Explanation:

I. Internet facility is not available at Krishna's house.

It is suggested by the statement as because of no internet facility available in Krishna's house the person cannot contact through e-mail.

II. Nowadays it has become difficult to contact people on e-mail.

It is not implicit in the statement.

Hence, only assumption I is implicit.

53. Answer: a

Explanation:

Given:

The sum at the same simple interest becomes amount to Rs 457 in 5 years and Rs 574 in 10 years.

Concept Used:

Sum = Amount - Interest

Calculation:

The amount after 5 years is Rs. 457 and sum after 10 years is Rs. 574

The simple interest in 5 years is $(574 - 457) = 117$

Sum = $457 - 117$

$\Rightarrow 340$

\therefore The value of the sum is Rs. 340.

54. Answer: c

Explanation:

The correct answer is Credit Information Bureau India Limited.

★ Key Points

Credit Information Bureau India Limited(CIBIL) is a credit information company.

- It is founded in year **2000** and its headquarter is in **Mumbai, Maharashtra**.
- It is established under **Credit Information Companies (Regulation) Act**, and authorised by RBI.
- Now it is known as **TransUnion CIBIL** as it is acquired by **TransUnion** (American consumer credit reporting agency) in 2016.

★ Additional Information

- Other credit information company of India are **CRIF High Mark**, **Equifax**, and **Experian**.
- The function of credit information company is to collect data from different creditors and generate a report of a particular consumer, which is helpful for the lender to understand whether the particular consumer is how much trust worthy and he will return the loan

55. Answer: a

Explanation:

Given:

I: Katir read the last 50 pages of the book on Sunday morning.

II. The book contains 450 pages, of which two-thirds of the pages were read before Saturday.

Concept Used:

Simplification

Calculation:

From statement II:

The book contains 450 pages and two-thirds of the pages were read before Saturday.

Page read before Saturday $(\frac{2}{3}) \times 450$

$\Rightarrow 300$

Remaining pages $(450 - 300) = 150$

From statement I:

Read last 50 pages on Sunday morning.

Pages read in Saturday is $(150 - 50) = 100$

\therefore From the above, it is clear that we need two statements together to get the desired result.

56. Answer: d

Explanation:

The correct answer is Sikkim.

★ Key Points

- **Kanchenjunga** is the highest peak in India situated in **Sikkim**.
- Its height is about **8,586 meters**.
- It is the **3rd highest mountain** in the world.
- It is the natural habitat of **Asian black bear, Red panda, white-bellied musk deer, chestnut-breasted partridge, blood pheasant, and snow leopard**.
- There are total **14 protected areas** in the regions of Kanchenjunga.

★ Important Points

- **Khangchendzonga National Park** is a National Park and a Biosphere reserve in **Sikkim** listed in **UNESCO World Heritage Sites** in July 2016.
- It is the India's first **mixed heritage site**, also included in **UNESCO Man and the Biosphere Programme**.

★ Additional Information

- **Nanda Devi** is the 2nd highest peak in India situated in **Chamoli district** of **Uttarakhand**.
 - It is the part of **Garhwal Himalayas**.
 - Its height is about **8,126 meters**.
 - **Nanda Devi National Park** is located in the regions of Nanda Devi peak is was a included in **UNESCO World Heritage Site** since **1988**.
- **Pir Panjal Range** is a mountains range in the Lesser Himalayan region in **Himachal Pradesh**.
- **Tawang** is a Hill station in **Arunachal Pradesh** famous for **Tawang Monastery** which is the is the **largest monastery in India**.

57. Answer: a

Explanation:

Concept:

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

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

Calculations :

$$4.5 - [2 - 0.25 \{4 - 6 \div (2.7 - 0.7)\}] = ?$$

$$\Rightarrow 4.5 - [2 - 0.25 \{4 - 6 \div 2\}] = ?$$

$$\Rightarrow 4.5 - [2 - 0.25 \{4 - 3\}] = ?$$

$$\Rightarrow 4.5 - [2 - 0.25 \{1\}] = ?$$

$$\Rightarrow 4.5 - [2 - 0.25] = ?$$

$$\Rightarrow 4.5 - [1.75] = ?$$

$$\Rightarrow 4.5 - 1.75 = ?$$

$$\Rightarrow 2.75 = ?$$

$$\therefore ? = 2.75$$

58. Answer: a

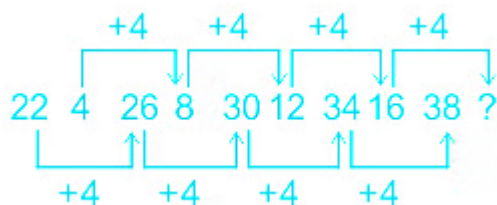
Explanation:

Given:

22, 4, 26, 8, 30, 12, 34, 16, 38, ?

We have to find the term in place of the question mark

Calculation:



<diagram>

First, we have to divide the series into two separate series

Difference between each term of the series is 4

$$22 + 4 \rightarrow 26 + 4 \rightarrow 30 + 4 \rightarrow 34 + 4 \rightarrow 38$$

$$4 + 4 \rightarrow 8 + 4 \rightarrow 12 + 4 \rightarrow 16 + 4 \rightarrow 20$$

\therefore The missing number is 20

59. Answer: b

Explanation:

Given:

A can do the work alone in 11 days and B can do the same in 16.5 days.

A, B, C together can complete the work in 5.5 days

C and D together can do the work in 22 days

Concept Used:

A man can do a work in x days implies the man can do $1/x$ part of the task in 1 day

Calculation:

Let, C can do the work alone in x days

In 1 day C can do $1/x$ part of the work

In 1 day A can do $1/11$ part of the work

In 1 day B can do $1/16.5 = 2/33$ part of the work

Together they can do the task in 5.5 day

In 1 day they will do $1/5.5 = 2/11$ part of the work

accordingly,

$$1/11 + 2/33 + 1/x = 2/11$$

$$\Rightarrow 1/x = 2/11 - 1/11 - 2/33$$

$$\Rightarrow 1/x = (6 - 3 - 2)/33$$

$$\Rightarrow 1/x = 1/33$$

$$\Rightarrow x = 33$$

C alone can do the work in 33 days.

Let, D alone can do the work in y days

In 1 day D can do $1/y$ part of the work

C and D can do the work in 22 days together

In 1 day C and D can do $1/22$ part of the work

In 1 day C alone can do $1/33$ part of the work

Accordingly,

$$1/33 + 1/y = 1/22$$

$$\Rightarrow 1/y = 1/22 - 1/33$$

$$\Rightarrow 1/y = (3 - 2)/66$$

$$\Rightarrow y = 66$$

\therefore D needs 66 days to do the work alone.

60. Answer: b

Explanation:

The correct answer is Andhra Pradesh.

★ Key Points

- World's first thermal battery making facility was inaugurated in Andhra Pradesh .

★ Important Points

- Bharat Energy Storage Technology Pvt. Ltd(BEST) is the manufacture of the thermal battery in India.
- It is the source of renewable energy and helps to provide energy to remote areas.
- These batteries are used in telecom sector, mini/micro grids, and electric buses .

61. Answer: a

Explanation:

The correct answer is 20 m/s.

★ Key Points

- As we know 1 Km = 1000 m and 1 hour = 3600 seconds
- $72 \text{ Km/hr} = 72 \times 1000 / 3600 = 20 \text{ m/s}$.
- So the converted velocity is **20 m/s**.

62. Answer: c

Explanation:

The correct answer is Part III.

★ Key Points

- Part III ,articles 12 to 35 of the Indian Constitution deals with **Fundamental Rights**.
- Article 21 of the Indian Constitution says that " No person shall be deprived of his life or personal liberty except according to the procedure established by law ". Hence, the phrase personal liberty is all about privacy
- This article can not be suspended at a time of emergency.
- Fundamental Rights are borrowed from the Bill of Rights of the United States .

★ Additional Information

- Part IV, articles 36 to 51 of the Indian Constitution deals with **Directive principles of state policy** .
- Part I, articles 1 to 4 of the Indian Constitution deals with **The Union and its Territory**.
- Part II, articles 5 to 11 of the Indian Constitution deals with **Citizenship**.

63. Answer: c

Explanation:

The correct answer is Q/t.

★ Key Points

- **Electric current** is defined as the rate of flow of charge per unit time.
- The **S.I. unit** of current is **Ampere** .
- It is a **scalar quantity** , and its symbol is " **I**".
- **Ammeter** is a **measuring instrument** use to measure **electric current** .

★ Additional Information

- **Charge** is the basic property of matter by the virtue of which it produces or experiences electric and magnetic effects.
 - The S.I. unit of Charge is **Coulomb** .
- The S.I. unit of time is Second.

64. Answer: c

Explanation:

Given:

We have to find the difference between $\frac{25}{12}$ and $\frac{15}{8}$

Concept Used:

Concept of fractional subtraction

Calculation:

$$\frac{25}{12} - \frac{15}{8}$$

$$\Rightarrow \frac{50-45}{24}$$

$$\Rightarrow \frac{5}{24}$$

∴ The required difference between $\frac{25}{12}$ and $\frac{15}{8}$ is $\frac{5}{24}$.

65. Answer: c

Explanation:

Given:

Mean of smallest 5 numbers = 19

Average of 13 numbers = 21

Formula used:

Average = (Sum of all values)/(number of value)

Calculation:

Sum of smallest 5 numbers

⇒ (Sum of smallest 5 numbers)/5 = 19

⇒ Sum of smallest 5 numbers = 95

Sum of all 13 numbers

⇒ (Sum of all 13 numbers)/13 = 21

⇒ Sum of all 13 numbers = 21 × 13

⇒ Sum of all 13 numbers = 273

The Sum of the maximum of 8 numbers

⇒ 273 - 95

⇒ 178

Mean of the maximum of 8 numbers

⇒ 178/8

⇒ 22.25

∴ The mean is 22.25.

66. Answer: a

Explanation:

The correct answer is Taj Mahal.

★ Key Points

- Agra is known for Taj Mahal (Tomb of Mumtaz Mahal, built by the Mughal emperor Shah Jahan for the memory of his favourite wife).
- The **Taj Mahal** is in the list of **UNESCO World Heritage Site** since 1983.
- **Ustad Ahmad Lahauri** was the **chief architect** of Taj Mahal.
- Construction of Taj Mahal was started in AD 1632 and was completed in late 1648 AD.

★ Important Points

- Agra Fort is a historical fort in the city of Agra in India. It was the main residence of the emperors of the Mughal Dynasty until 1638.
- Moti Masjid inside Agra Fort was built by Mughal emperor Shah Jahan.
- The tomb of Akbar is at Sikandra, approximately 8 km from main city of Agra.
- Fatehpur Sikri is a town in the Agra District, known for Buland Darwaza, and Tomb of Salim Chishti, the city itself was founded as the capital of Mughal Empire in 1571 by Emperor Akbar to 1585.

★ Additional Information

- **Red Fort** was built by Mughal emperors **Shah Jahan**.
 - Construction of **Red Fort** was started in AD 1639 and was completed in late 1648 AD.
 - Ustad Ahmad Lahauri was the chief architect of Red Fort.
 - Moti Masjid inside Red Fort, Delhi was built by Aurangzeb.
 - Red Fort is in the list of **UNESCO World Heritage Site** since 2007.

- Qutub Minar is the world's tallest minaret built of bricks .
 - The height of Qutb Minar is about 73 meters.
 - The construction of Qutub Minar was started by Qutb-ud-din Aibak (Founder of the Slave Dynasty) and completed by Shamsuddin Iltutmish (Second ruler of Slave Dynasty).
 - The topmost storey was built by Firoz Shah Tughlaq of Tughlaq Dynasty.
 - Qutub Minar is in the list of UNESCO World Heritage Site.

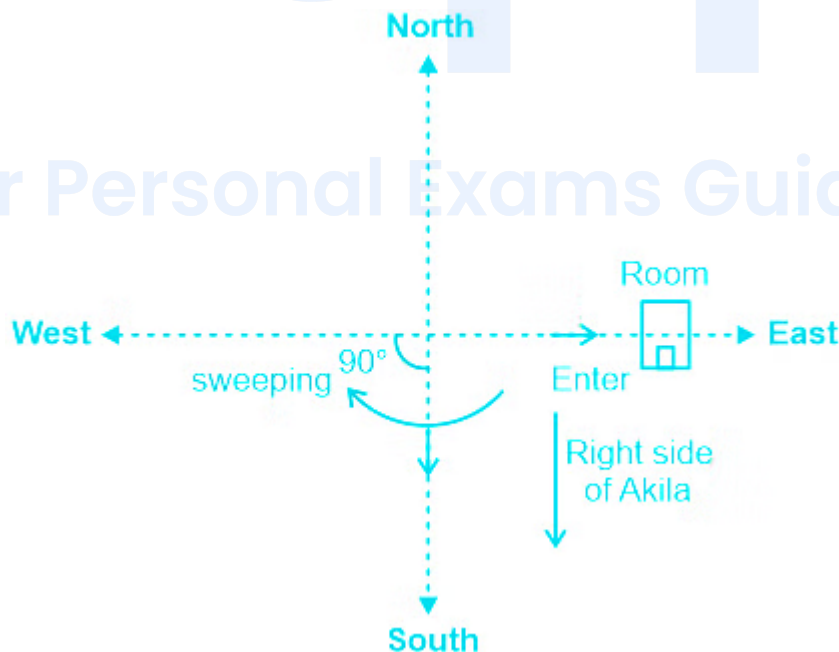
67. Answer: b

Explanation:

According to the conditions,

The lady starts sweeping from her right. She ends up towards the south.

Then she starts sweeping 90° towards her right then the broom will end up pointing towards the west.



So, the broom is in the west direction now.

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

68. Answer: c

Explanation:

The correct answer is **Gujrat** .

★ Key Points

- **Narendra Modi** was the four term Chief Minister of **Gujrat** state during the tenure from **2001 to 2014** .
- He was elected **Member of legislative assembly** from **Rajkot Pashchim** for the first term and from **Maninagar** for the rest three term from 2001 to 2014 .
- Narendra Modi is the current Prime Minister of India.
- He is serving as **Prime Minister** since **2014** .
- He is the elected **Member of Parliament** from **Varanasi constituency** of Uttar Pradesh.

★ Important Points

- Current **Chief Minister** of **Gujrat** state is **Bhupendra Patel** and Governor is **Acharya Devvrat**.
- Capital of **Gujrat** is **Gandhinagar** .

★ Additional Information

State	Capital	Chief Minister	Governor
Bihar	Patna	Nitish Kumar	Phagu Chauhan
Uttar Pradesh	Lucknow	Yogi Aditya nath	Anandiben Patel
Rajasthan	Jaipur	Ashok Gehlot	Kalraj Mishra

69. Answer: c

Explanation:

Given:

Tap A can fill in 35 hours

Tap B can empty in 70 hours.

Calculation

Tap A can fill in 35 hours

Tap A can fill in 1 hour = $\frac{1}{35}$

Tap B can empty in 70 hours.

Tap B can empty in 1 hour = $\frac{1}{70}$

Tap A and Tap B can fill in 1 hour

$$\Rightarrow \left(\frac{1}{35}\right) - \left(\frac{1}{70}\right)$$

$$\Rightarrow \frac{1}{70}$$

Tap A and Tap B can fill the full tank

$$\Rightarrow 70 \text{ hours}$$

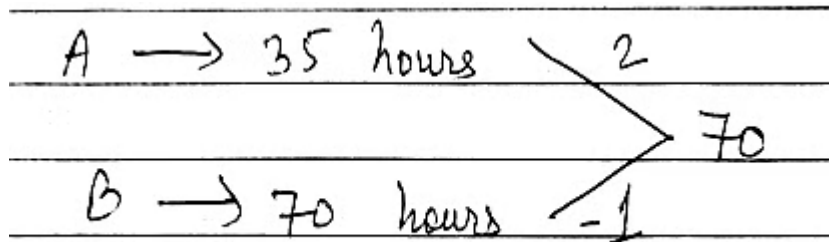
Tap A and Tap B can fill the half-tank

$$\Rightarrow \frac{70}{2}$$

$$\Rightarrow 35 \text{ hours}$$

\therefore The half tank is filled in 35 hours.

★ Alternate Method



Tap A and Tap B can fill in 1 hour

$$\Rightarrow 2 - 1 = 1$$

Half tank capacity

$$\Rightarrow 70/2$$

$$\Rightarrow 35$$

Tap A and Tap B can fill the half-tank

$$\Rightarrow 35/1$$

$$\Rightarrow 35 \text{ hours}$$

\therefore The half tank is filled in 35 hours.

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70. Answer: d

Explanation:

The correct answer is Lord Dalhousie.

★ Key Points

- " **Doctrine of lapse**" is an annexation policy implemented by Lord Dalhousie.
- The policy states that any **Indian princely state** under the British East India Company would have this status abolished if the ruler is not able to compete or does not have any male heir .

- Some of the important princely states that were annexed under the doctrine of lapse were –

1. Jhansi
2. Kurnool
3. Nagpur
4. Ramgarh
5. Surat

★ Important Points

- **Lord Dalhousie** was born on **22nd April 1812**.
- His full name was **James Andrew Broun Ramsay**.
- Some important organizations founded by him include –

1. **Central public works department**
2. **Tamil Nadu** public works department.

71. Answer: d

Explanation:

Given:

Principal = Rs. 200

Rate = 10%

Formula used:

Simple Interest = $(\text{Principal} \times \text{Rate} \times \text{Time})/100$

Compound Interest = $\text{Principal}[(1 + \text{rate}/100)^{\text{time}} - 1]$

Calculation:

Simple Interest in 1 year

$$\Rightarrow (200 \times 10 \times 1)/100$$

$$\Rightarrow 20$$

Compound Interest compound half yearly

$$\text{rate} = 10/2 = 5\%, \text{time} = 2$$

$$\Rightarrow 200[(1 + 5/100)^2 - 1]$$

$$\Rightarrow 20.5$$

Difference of interest

$$\Rightarrow 20.5 - 20$$

$$\Rightarrow 0.5$$

\therefore The difference of interest is 0.50 paisa.

72. Answer: c

Explanation:

The correct answer is R.K Narayan.

★ Key Points

- **Swami and Friends** is a novel that was published in the year **1935**.
- The book was originally published in the **English language**.
- It is a fictional book consisting of **459 pages**.
- The television drama series "**Malgudi days**" is based on this novel.
- The novel was listed in 2019 under the "**100 most influential novels**".

★ Important Points

- **R.K Narayan** was born on **10th October 1906** in the **Madras presidency**.
- His full name is **Rasipuram Krishnaswami Iyer Narayanaswami**.
- He has been awarded the following awards -

1. Filmfare award for best story.
 2. Padma Bhushan
 3. Padma Vibhushan.
-

73. Answer: c

Explanation:

The correct answer is Red.

★ Key Points

- **Sulphuric acid** is also known as **oil of vitriol**.
- It is composed of **sulfur, hydrogen, and oxygen** element.
- The acid has a very **strong acidic nature**.
- It has several uses such as **fertilizer manufacture, mineral processing, oil refining, and wastewater processing**.
- It is also known by the name **hydrogen sulfate**.

★ Important Points

- The **litmus solution** is a **purple dye solution**.
 - It is **extracted from the plant** called "**Lichen**".
 - It is used as an **acid-base indicator**.
-

74. Answer: a

Explanation:

On observing all the figure all have even number of spikes while the figure in option B has odd numbers of spikes.

Hence, Figure b is the odd among all

75. Answer: a

Explanation:

Concept used:

The minimum number of arms required to mark any polygon is 3

Triangle has the minimum number of arms.

Solution:

From the above concept the minimum of arms required to form polygon is 3

So the correct answer is option 1

76. Answer: b

Explanation:

Book : Chapter → Chapters are found inside a book.

Similarly, **Your Personal Exams Guide**

Car : ? → A steering is found inside a car.

Hence, 'steering' is the correct answer.

77. Answer: c

Explanation:

I. Counseling is one of the ways to correct behavioral problems.

It can be concluded from the statement as the statement itself mentions that the child needs to be counselled for his bad behaviour.

II. Counseling is the only way to correct the behavior.

It cannot be concluded as there are other better ways too to correct the bad behaviour of a student.

Hence, only conclusion I follows.

78. Answer: d

Explanation:

The correct answer is cross-section wire.

★ Key Points

- **Resistance** is a property of an **electric circuit**.
- It transforms **electrical energy into heat energy**.
- The **reciprocal of resistance is conductance**.
- The **SI unit of resistance is the ohm**.
- The **unit** is named after the German physicist **George ohm**.
- The **electrical resistance** is measured by two methods namely **constant current or constant voltage**.

★ Important Points

- The **resistance of a wire** depends upon the **material of the wire**.
- It is **directly proportional to the length** of the wire.
- And is **inversely proportional to the cross-section area**.

79. Answer: a

Explanation:

The correct answer is 1000 m /s.

★ Key Points

- The **sound waves** are a type of **longitudinal waves**.
- These **waves travel through a medium** like **air or water**.
- **sound waves** can also be categorized into **mechanical waves** or **pressure waves**.
- Some of the examples of **longitudinal waves** are **Tsunami waves, clapping, and earthquakes**.

★ Important Points

- To calculate the **speed of sound waves**, the formula will be calculated as –

Speed = wavelength x frequency.

- The **wavelength** can be defined as the distance between **two successive crests** or **two successive troughs**.
- **Frequency** can be defined as the **number of waves** that pass through a fixed point in a definite amount of time.

80. Answer: b

Explanation:

The correct answer is 1.43 s.

★ Key Points

- In order to calculate the **time taken by the object to the highest point**, we have to calculate the **initial velocity of the object**.
- To calculate the initial velocity, we have to use the formula $v^2 - u^2 = 2gs$.
 - Here, **v** is the **final velocity** and **u** is the **initial velocity** with which the object was thrown up.
- To calculate the time, we have to use the formula $v = u + gt$.
- Here, $t = v - u / g$.

Solution:

Initial Speed (u) = 14 m/s

Final speed (v) = 0 m/s

Acceleration due to gravity (g) = - 9.8 m/s²

we know,

$$\Rightarrow v = u + gt$$

$$\Rightarrow 0 = (14) + (- 9.8) \times t$$

$$\Rightarrow 14 = 9.8t$$

$$\Rightarrow t = 1.42 \text{ s}$$

★ Important Points

- G is gravity constant.
- The value of G is $6.67430 (15) \times 10^{-11}$.
- It is also known as the **Newtonian constant of gravitation**.

81. Answer: b

Explanation:

Given:

$$(A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix})$$

$$AB = A$$

Calculation:

$$(A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 0 \\ 0 & 2 \end{bmatrix})$$

$$AB = A$$

$$\Rightarrow \left(\begin{bmatrix} *_{20}\{c\} & 1 & 2 & \dots & 3 & 1 \end{bmatrix} \right) \times \left(\begin{bmatrix} *_{20} & 1 & 0 & \dots & 0 & z \end{bmatrix} \right) = \left(\begin{bmatrix} *_{20}\{c\} & 1 & 2 & \dots & 3 & 1 \end{bmatrix} \right)$$

Do matrix multiplication

$$\Rightarrow \left(\begin{bmatrix} *_{20}\{c\} & 1 & 2 & \dots & 3 & 1 \end{bmatrix} \right) \times \left(\begin{bmatrix} *_{20} & 1 & 0 & \dots & 0 & z \end{bmatrix} \right) = \left(\begin{bmatrix} *_{20}\{c\} & 1 & 2 & \dots & 3 & 1 \end{bmatrix} \right)$$

By comparing values

$$\Rightarrow z = 1$$

\therefore Both statements 1 and 2 are required to find the value of z.

82. Answer: d

Explanation:

Given:

Difference between $3/8$ and smaller number = $1/5$

Calculation:

Let the another number be 'x'

$$\Rightarrow (3/8) - x = 1/5$$

$$\Rightarrow (3/8) - (1/5) = x$$

$$\Rightarrow x = (15 - 8)/40$$

$$\Rightarrow x = 7/40$$

\therefore The another number is $7/40$.

83. Answer: b

Explanation:

The correct answer is Australia.

★ Key Points

- The **commonwealth games** is an international event that involves different nations.
- It was first held in the year 1930.
- Earlier it was known by different names such as **British empire games**, the **British empire and commonwealth games**, and **British commonwealth games**.
- Some of the important games that are played in this event include **Badminton**, **Athletics**, **Boxing**, **Basketball**, and **Cricket**.

★ Important Points

- The capital of Australia is **Canberra**.
- It has a **parliamentary form of government** in which the **upper house** is the **senate** and the **lower house** is the **House of representatives**.
- The country is a member of several organizations such as the **United Nations**, **OECD**, **World trade organization**, and **ANZUS**.

84. Answer: d

Explanation:

The correct answer is Sarbananda Sonowal.

★ Key Points

- **Sarbananda Sonowal** was born on **31st October 1961** in **Dibrugarh**.
- He belongs to the **Bhartiya Janta Party**.
- He has also served as the **union minister for sports and youth affairs**.

- Currently, he is serving as the **14th CM of the state**.
- Earlier he has been appointed as a member of the consultative committee of the ministry of home affairs, a national executive member of BJP, and a member of the consultative committee of the ministry of commerce and industry.

★ **Important Points**

- The **capital of Assam** is **Dispur**.
- It is a **north-eastern state**.
- The **state** is famous for **Assam tea and Assam silk**.
- The **state** was formed on **26th January 1950**.

85. Answer: d

Explanation:

Calculation:

School XYZ, Passing percentage in different years are:

2012-13 = 78, 2013-14 = 69, 2014-15 = 81, and 2015-16 = 92

In 2013 - 14 performance decrease from previous year.

School ABC

2012 - 13 = 61, 2013 - 14 = 72, 2014 - 15 = 84, 2015 - 16 = 96

In every year performance increase

School PQR

2012 - 13 = 81, 2013 - 14 = 92, 2014 - 15 = 85, 2015 - 16 = 97

In 2014 - 15 performance decrease from previous year.

School TUV

$2012 - 13 = 92, 2013 - 14 = 69, 2014 - 15 = 72, 2015 - 16 = 95$

In 2013 - 14 performance decrease from previous year.

\therefore Clearly School ABC performance increase every year.

86. Answer: b

Explanation:

Given:

Sand : cement = 7 : 1

Total quantity of mixture = 72 kg

Resulting mixture ratio = 6 : 1

Calculation:

Total quantity of mixture = 72 kg

Sand : cement = 7 : 1

$\Rightarrow 7 + 1 = 8$ unit

$\Rightarrow 8$ unit = 72 kg

$\Rightarrow 1$ unit = 9 kg

Sand = $7 \times 9 = 63$ kg

Cement = 9 kg

Let the cement added be 'x'

$\Rightarrow 63 / (9 + x) = 6 / 1$

$\Rightarrow x = 9 / 6$

$$\Rightarrow x = 1.5 \text{ kg}$$

\therefore The quantity of cement added is 1.5 kg.

87. Answer: b

Explanation:

The correct answer is the Fallopian tube.

★ Key Points

- The **process of fertilization** in the human body involves the union of human **eggs and sperm in the fallopian tube**.
- Later it leads to the formation of a **zygote cell** or fertilizes an egg.
- There is another process called **IVF** that stands for "In Vitro fertilization".
- In **IVF** the egg cells are **fertilized by the sperm outside the womb**.
- The process of fertilization in human beings begins with ejaculation during copulation and ovulation.

★ Important Points

- The **fallopian tube** is also called a **uterine tube** or **salpinges**.
 - It helps in the **transportation of ova** from the ovary to the uterus.
 - The tube was named after the **Italian anatomist Gabriele Falloppio**.
-

88. Answer: a

Explanation:

The correct answer is Gujarat.

★ Confusion Points

- This is previous year question and according to board the correct answer is Gujarat.
- But, As on 17th September 2021, Maharashtra is leading in cotton acreage with 39.41 lakh ha followed by Gujarat (22.51 lakh ha), Telangana (18.78 lakh ha), Rajasthan (7.08 lakh ha) and Haryana (6.88 lakh ha).

★ Key Points

- Cotton is a type of **cellulose fiber**.
- Some important sources of cotton include **Gossypium herbaceum, Gossypium arboreum, and Sea island cotton**.
- Cotton has several uses such as **fishing net, bookbinding, cotton paper, cotton filter, tent, etc.**
- Some important characteristics of cotton include **absorbent, lightweight, and softness**.

★ Important Points

- **World cotton day** is celebrated on **7th October**.
- The organization "**Cotton corporation of India**" was founded on **31st July 1970**.
- Its headquarter is in **Mumbai**.

89. Answer: d

Explanation:

Given:

$$\frac{5}{13} + \frac{13}{5}$$

Calculation:

$$\frac{5}{13} + \frac{13}{5}$$

$$\Rightarrow (5/13) + (13/5)$$

$$\Rightarrow (25 + 169)/65$$

$$\Rightarrow 194/65$$

$$\Rightarrow 2\frac{64}{65}$$

\therefore The value is $2\frac{64}{65}$.

90. Answer: c

Explanation:

The correct answer is Uttar Pradesh.

★ Key Points

- Shahzar Rizby was born on 18th June 1994.
- He is an Indian professional shooter.
- ISSF stands for **international shooting for sports federation**.
- Its headquarter is in **Munich, Germany**.
- It was founded in the year **1907** and its president is **Vladimir Lisin**.

★ Important Points

- Some important competitions recognized by ISSF includes –
 1. Olympic games
 2. ISSF World shooting championship.
 3. ISSF world cup.
 4. ISSF junior world cup.

91. Answer: c

Explanation:

- I. There are various traditional weaving methods.

It can be concluded as the statement mentions to develop our traditional weaving methods by promoting handicraft.

II. Handicraft products are not affordable for the general public.

It cannot be concluded as there is no data given related to price of the handicraft products.

Hence, only conclusion I follows.

92. Answer: b

Explanation:

Given:

Two roots of quadratic equation $x = 1/11$ and $x = -1/9$

Concept used:

Any quadratic equation can be written in the form of $(x - a)(x - b) = 0$, where a and b are the roots of the Quadratic Equation.

Calculation:

From above concept,

We can write Quadratic equation in the form $(x - 1/11)[(x - (-1/9))] = 0$

$$\Rightarrow (x - 1/11)[(x + 1/9)] = 0$$

$$\Rightarrow [(11x - 1)/11][(9x + 1)/9] = 0$$

$$\Rightarrow (11x - 1)(9x + 1) = 0$$

\therefore Equation can be written in the form $(11x - 1)(9x + 1)$

93. Answer: a

Explanation:

The correct answer is "Sanjay Leela Bhansali".

★ Key Points

- Padmaavat's movie was directed by Sanjay Leela Bhansali .
- The actors who participated in this movie includes Shahid Kapoor, Deepika Padukone, and Ranveer Singh.
- The movie was released on 25th January 2018 .
- It was a big-budget film.
- Some other people that were involved in this film were Ujjawal Chopra, Aditi Rao hydradi, and Raza Murad.

★ Important Points

- Sanjay Leela Bhansali was born on 24th Feb 1963.
- He is a director, producer, and screenwriter.
- He has got several awards such as Padma Shri, Zee gold award, and screen award for best director.

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94. Answer: b

Explanation:

The correct answer is Peter Sutherland.

★ Key Points

- Peter Denis Sutherland was born on 25th April 1946.
- Earlier he has served as the UN special representative for international migration from 2006 to 2017.
- He was the chairman of Allied Irish Banks (AIB).

- He has also got **fifteen honorary doctorates** from the universities of **Europe and America** .

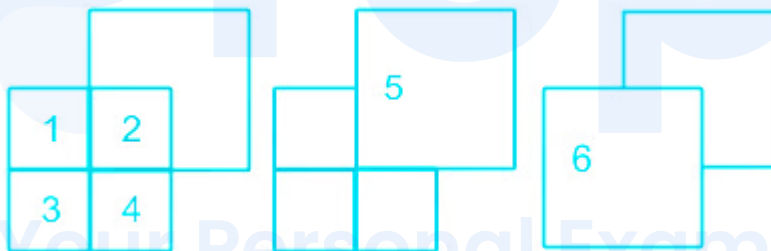
★ Important Points

- Some other positions held by him include –
 1. **Attorney General of Ireland.**
 2. **Goodwill Ambassador for the United Nations Industrial Development Organization.**
 3. Chairman of **Goldman Sachs international** .

95. **Answer: a**

Explanation:

The number of squares in the following figure is shown below:



Hence, '6' is the correct answer.

96. **Answer: d**

Explanation:

All options except 'snake' are methods of sharing information or exchanging conversation while snake is a reptile.

Hence, 'snake' is the odd one out.

97. Answer: b

Explanation:

The correct answer is Spanish.

★ Key Points

- Spanish is a roman language.
- It is the **world's second** most spoken **native** language.
- It is one of the **official languages of the European Union** .
- It is also known as **Castilian or Castellano**.
- **Some important country's that uses this language includes -**

1. Mexico
2. United States
3. Chile
4. France
5. Brazil
6. Australia
7. Poland
8. Switzerland
9. Ireland
10. Finland.

98. Answer: c

Explanation:

Given:

Speed of cyclist in first 3 km = 8 km/h

Speed of cyclist in next 2 km = 3 km/h

Speed of cyclist in last 2 km = 2 km/h

Formula used:

(i) Speed = Distance/Time

(ii) Average speed = (Total distance travelled)/(Total time taken)

Calculations:

$$\text{Average speed} = (3 + 2 + 2) / \{(3/8) + (2/3) + (2/2)\}$$

$$\Rightarrow 7 / \{(9 + 16 + 24) / 24\}$$

$$\Rightarrow 7 / (49/24)$$

$$\Rightarrow (7 \times 24) / 49$$

$$\Rightarrow 3.43 \text{ km/h}$$

\therefore The approximate average speed of the entire journey is 3.43 km/h.

99. Answer: c

Explanation:

The correct answer is Mass.

★ Key Points

- **Mass** is one of the fundamental properties of the matter .
- The SI unit of mass is Kg.
- The mass of an object helps to determine the strength of its gravitational attraction to the other bodies .
- **Force** is the phenomenon of pushing or pulling an object.

★ Additional Information

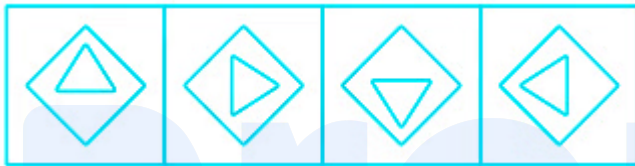
- The SI unit of force is Newton.

- **Acceleration** can be defined as the **rate of change of velocity** of an object with respect to time.
- The SI unit of **acceleration** is m/s^2 .
- **Acceleration** is a vector quantity.

100. Answer: d

Explanation:

The series is rotating in 90° clockwise direction.



Hence, 'option 4' is the correct answer.

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