



Your Personal Exams Guide



NDA



CDS



SSC CGL



CBSE UGC NET



IAS



SSC CHSL



CTET



MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



SSC MTS



SBI PO



BPSC



UP TET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

RRB Group D 2018 Previous Year Paper (11-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. Which of the following is a finite decimal or terminating decimal? (+1, -0.33)
- a. $1/24$
 - b. $1/32$
 - c. $1/96$
 - d. $1/48$
-
2. The LCM of two positive numbers is three times their HCF. If the product of the LCM and the HCF is 867, find the numbers. (+1, -0.33)
- a. 17, 51
 - b. 27, 81
 - c. 13, 39
 - d. 51, 153
-
3. If an object is placed between a concave mirror and F, what will be the type of image formed? (+1, -0.33)
- a. Virtual
 - b. Actual
 - c. Complete
 - d. Incomplete
-

4. If 8 December 2007 was a Saturday, then what was the day on 12 August 2008? (+1, -0.33)

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

5. Find the value of $x^2 - y^2$ (+1, -0.33)

- 1. If $x + y = 2$
- 2. If $x - y = 6$
- a. Only 1 is sufficient
- b. Neither 1 nor 2 is sufficient
- c. Only 2 is sufficient
- d. Both 1 and 2 together are sufficient

6. Three of the four options below are related in a particular way. Select the option which is different or mismatched from the others. (+1, -0.33)

- a. Hand
- b. Nose
- c. Heart
- d. Eyes

7. Which of the following statements is not true regarding the effect of increasing temperature on the distribution of molecular motion in a gas? (+1, -0.33)

- a. Most likely speed increases.
- b. The area under the distribution curve remains the same as below the lower temperature.
- c. Distribution becomes widespread.
- d. The fraction of molecules increases with the most possible speed.

8. The _____ coast in Kerala is a beautiful backwater lined with coconut trees. (+1, -0.33)

- a. Khambhat
- b. Malabar
- c. Konkan
- d. Coromandel

9. Two Indians have won the Ramon Magsaysay Award 2018. One of them is Sonam Wangchuk. What is the name of the second Indian to win the award? (+1, -0.33)

- a. Bharat Watwani
- b. Aruna Roy
- c. Prakash Amte
- d. Rajendra Singh

10. The value of $4.5 + 0.45 + 0.045 + 0.0045$ is: (+1, -0.33)

- a. 5.0005
- b. 4.99995
- c. 4.995
- d. 4.9995

11. $(11/13) + (13/11) = ?$ (+1, -0.33)

- a. $290/143$
- b. $24/143$
- c. 2
- d. $245/24$

12. City Montessori School, named in the Guinness Book of World Records for the largest number of students, is one of the most popular schools of (+1, -0.33)

- a. Mirzapur
- b. Allahabad
- c. Lucknow
- d. Kanpur

13. The farmer left a cow to walk west. The cow started grazing. After some time, the cow started moving to its right and reached a position that was (+1, -0.33)

90 degrees from its starting position. Which direction is the cow facing now?

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

14. The ratio of copper, zinc and nickel in German silver is 4 : 3 : 2. How many kilograms of zinc is added to this metal of 54 kg so that the new ratio becomes 2 : 5 : 1? (+1, -0.33)

- a. 48
- b. 50
- c. 36
- d. 42

Your Personal Exams Guide

15. A tank has two pipes. Pipe M is for filling the tank and pipe N is for emptying the tank. If pipe M takes 45 hours to completely fill the tank and pipe N takes 90 hours to empty the fully filled tank, then how many hours will they take to together fill the half empty tank completely? (+1, -0.33)

- a. 35 hours
- b. 40 hours
- c. 45 hours
- d. 60 hours

16. Four couples go to a party. All the women are wearing different colour sarees. All men are wearing different coloured shirts. The colour of a shirt and a saree can be the same. Consider all the statements given below and answer the questions. (+1, -0.33)

Statement:

1. Rama is married to Ramesh who is wearing a red shirt.
2. Purva, who is not Anup's wife, is wearing a blue sari.
3. Anup and Shreya are wearing green clothes.
4. Sandesh's wife Mrunmayi has not worn a yellow sari.
5. Viraj is wearing a yellow shirt.

Question:

Who is Shreya's husband?

- a. Anup
- b. Ramesh
- c. Sandesh
- d. Viraj

17. Which of the following procedures would you use to separate ammonium chloride from sodium chloride? (+1, -0.33)
- a. Distillation
 - b. Sublimation
 - c. Crystallization

d. Filtration

18. What is the molecular formula of isobutane? (+1, -0.33)

a. C_4H_8

b. C_4H_{10}

c. C_3H_8

d. C_3H_6

19. $16^3 \div 8^3 \div 2^2 = ?$ (+1, -0.33)

a. 2^5

b. 2^1

c. 2^{-1}

d. 2^2

20. Lanthanide and actinide: (+1, -0.33)

a. s - Block element

b. f - Block element

c. d - Block element

d. p - Block element

21. _____ uses regenerated cells for reproduction through the process of budding. (+1, -0.33)

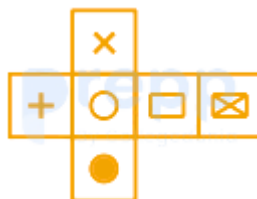
- a. Yeast
- b. Palnaria
- c. Hydra
- d. Amoeba

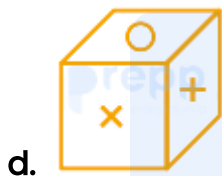
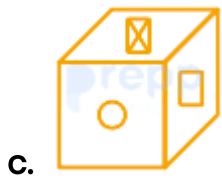
22. 4 W X Z 8 Q P O J 6 G T M V E U H 5 3 B (+1, -0.33)

In the above sequence, the 5th term to the right of 15th term from the left is:

- a. 4
- b. 6
- c. B
- d. T

23. To make a cube, the given shape is folded from the edges. Identify the option that correctly represents the faces of the cube. (+1, -0.33)





24. 91238769AZ

(+1, -0.33)

The water image of the above figure is:

a.

b.

c.

d.

25. A boy clapped near a rock and after 3 seconds he heard an echo. If the speed of the sound is 346 ms^{-1} , then how far is the boy from the rock?

(+1, -0.33)

- a. 219 meter
- b. 341 meter
- c. 346 meter
- d. 519 meter

-
26. Read the given statements and conclusions carefully and select the conclusions to be logically followed from the statements. (+1, -0.33)

Statement: In a democracy, majority rule.

Conclusion 1: In a democracy, candidates are elected by the majority.

Conclusion 2: Amendment of laws in democracy is done by majority vote in Parliament.

- a. Only conclusion 1 follows
- b. Only conclusion 2 follows
- c. Both 1 and 2 follow
- d. neither 1 nor 2 follows

-
27. At what time between 10 am and 11 am when the clock needles overlap or touch each other? (+1, -0.33)

- a. minutes before 11 o'clock
- b. minutes before 10 o'clock
- c. minutes after 10 o'clock
- d. minutes after 11 o'clock

28. What is the basis on which the parts of the flowers are present? (+1, -0.33)

- a. Placenta
 - b. Sepal
 - c. Fallopian Tube
 - d. Thalamus
-

29. Which of the following pair has not same unit? (+1, -0.33)

- a. Speed and velocity
 - b. Acceleration and acceleration due to Gravity
 - c. Momentum and force
 - d. Distance and Displacement
-

30. The ball, moving at a speed of 2 meters per second, directly hits a stationary gate twice its mass. If the coefficient of restitution or coefficient of retention is 0.5, what will be their velocity after hitting: (+1, -0.33)

- a. 1, 1.5
 - b. 0, 2
 - c. 1, 2
 - d. 0, 1
-

31. Which of the following river spreads over the Sapta Indus region and later dries up? (+1, -0.33)

- a. Chenab
- b. Yamuna
- c. Saraswati
- d. Jhelum

32. Suraj's sum is four times that of Ravi's sum. Ravi's sum is sixteen times Aditya's sum. What is the ratio of the sums of Aditya and Suraj? (+1, -0.33)

- a. 1 : 64
- b. 1 : 24
- c. 64 : 1
- d. 1 : 16

33. Read the given question and decide which of the following statements is correct to answer the question. (+1, -0.33)

Question: Who among P, N, K and J get the highest payment?

Statement:

- 1. P earns more than K and J.
 - 2. N earns more than K.
- a. Statements 1 and 2 are both correct.

- b. Statements 1 and 2 both are not correct.
 - c. Only statement 1 is correct.
 - d. Only statement 2 is correct.
-

34. An object of 20 kg mass moves with a speed of 5 ms^{-1} , its kinetic energy will be _____. (+1, -0.33)

- a. 250 Pa
 - b. 250 N
 - c. 250 kg
 - d. 250 J
-

35. If $3x^2 + ax - 12$ is completely divisible by $x - 8$ then the value of a is: (+1, -0.33)

- a. 24.5
 - b. 24.5
 - c. 22.5
 - d. 22.5
-

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

152, 148, 156, 152, ____

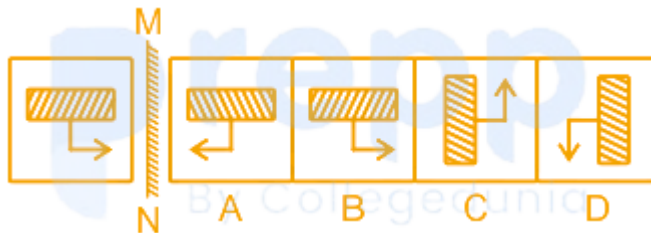
- a. 158
- b. 160

c. 156

d. 162

37. Select a mirror image for the following figure.

(+1, -0.33)



a. C

b. A

c. B

d. D

38. A and B together can do a work in 7 days and B and C together in 8.75 days and A can do the same work in 10.5 days. How many days will C take to complete double the same amount of work when working alone?

(+1, -0.33)

a. 31

b. 31.25

c. 30

d. 32.5

39. Three of the four options below are related in a particular way. Select the option which is different or unique from others.

(+1, -0.33)

- a. Gun
- b. Sword
- c. Write
- d. Spade

40. In _____, the consecutive electrons of the elements increase when going from one side to the other. (+1, -0.33)

- a. Class
- b. Line
- c. Period
- d. Group

41. India is hosting 'Two Plus Two' conversation with which country in September 2018? (+1, -0.33)

- a. USA
- b. UK
- c. France
- d. Germany

42. From point O, facing west, a person walks 4 km to reach point A, then from there, after walking 4 km to the right reaches point B, then after walking 4 km to the right he reaches point C, turning right, he walks 3 km to reach point D, turning left, he walks 4 km to reach point E, walking 5 km (+1, -0.33)

to the right reaches point F, the shortest distance between point B and point F is:

- a. $8\sqrt{2}$
- b. $5\sqrt{2}$
- c. $4\sqrt{2}$
- d. $3\sqrt{2}$

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

Odometer: Distance :: Ammeter: ?

- a. Earthquake
- b. Current
- c. Air
- d. Mass

-
44. Study the following information carefully and answer the following questions. (+1, -0.33)

Dhawan plans to buy a flat at Shyamla Society.

Shyamala Society has placed the following conditions for allotment of flats in its society:

Applicant :

- (i). State domicile certificate must be submitted.

(II). Must have done a job of at least 5 years.

(III). If needed, he will be ready to pay the entire amount in 5 years.

(IV). Should not be the owner or co-owner (if spouse) of the residential facility in that city

(V). Should not be below 35 years of age as on 31 December 2016.

In the case of the applicant who fulfils all other criteria except:

A) (I) As mentioned above, should be referred to the chairman of the city council.

B) (II) As mentioned above, prepared to provide Aadhaar card. To be referred to the vice-chairman of the committee

C) (III) As mentioned above, but a freedom fighter or ex-soldier or the first relationship with these should be referred to a member of the committee.

The last date for receipt of applications was 31 December 2016. The conditions of 31 December 2016 are to be met. Based on these criteria, decide whether you have to allot the flat in the following case given on 1 January 2017.

Dhawan is an industrialist and from another state who established his factory in 2000 and has a state residence certificate. He is ready to pay the full amount in 4 years if necessary. He does not have a house in that city but his wife has a flat. His date of birth is 11 November 1970.

- a. Will allot flats.
- b. Send for consideration to the Vice President.
- c. Do not allot flat.
- d. Send to the President for consideration.

45. The period between _____ is known as the period of Delhi Sultanate. (+1, -0.33)

- a. 1106 AD and 1326 AD
- b. 1606 AD and 1826 AD
- c. 1206 AD and 1526 AD
- d. 1006 AD and 1326 AD

46. Read the given statement (statements) and conclusions carefully. (+1, -0.33)

Assuming that the information given in the statement is true, even if it appears to be different from commonly known facts, select the logically inferential conclusions from the statement that are beyond a reasonable doubt.

Statement: All tonics are poisonous substances. All poisonous substances are poison.

Conclusions:

- 1. All poison are tonics.
- 2. Some poison are tonics.

- a. Either 1 or 2 follows
- b. Only 2 follows
- c. Only 1 follows
- d. Both 1 and 2 follow

47. Kakarpar Atomic Energy Station is located in the state of _____. (+1, -0.33)

- a. Gujarat
 - b. Rajasthan
 - c. Maharashtra
 - d. Karnataka
-

48. Select the word which is related to the third word in the same way as the second word is from the first word.: (+1, -0.33)

Hockey : Field :: Badminton : ?

- a. Pitch
 - b. Court
 - c. Arena
 - d. Stadium
-

49. The ratio of age of Mohan and Sohan is 5 : 4. If the sum of his present age is 36 years, then what is the present age of Sohan? (+1, -0.33)

- a. 14 years
 - b. 15 years
 - c. 12 years
 - d. 16 years
-

50. Which Indian airport has become the busiest single runway airport in the world? (+1, -0.33)

- a. Amausi Airport
 - b. Chhatrapati Shivaji Maharaj International Airport
 - c. Indira Gandhi International Airport
 - d. Calicut International Airport
-

51. Who among the following is the leader of the Communist Party of India (Marxist)? (+1, -0.33)

- a. Ram Madhav
 - b. Yogi Adityanath
 - c. Viplov dev
 - d. Sitaram Yechury
-

52. 63 people can dig a pond in 126 days. How many days can 98 people dig it? (+1, -0.33)

- a. 77
 - b. 90
 - c. 80
 - d. 81
-

53. The speed of a car moves from 5 m/s to 36 m/s. What will be the acceleration? (+1, -0.33)

- a. 1 ms^2

b. Calculation not possible.

c. 1.5 ms^{-2}

d. 0.11 ms^{-2}

54. Which is the prestigious civilian award given to MS Dhoni till date? (+1, -0.33)

a. Bharat Ratna

b. Padma Vibhushan

c. Padma Bhushan

d. Dronachary

55. How many rows are used to draw the following figure? (+1, -0.33)



a. 36

b. 55

c. 31

d. 28

56. Select the option that looks exactly like the mirror image of the given figure. (+1, -0.33)

figure.



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

57. Pointing to a woman, Khan said, "She is the daughter of my son's wife." (+1, -0.33)
How is the woman related to Khan?

- a. Granddaughter
- b. Cousin
- c. Uncle
- d. Daughter-in Law

58. Shiv Sena is the regional political party of which state? (+1, -0.33)

- a. Gujarat

- b. Maharashtra
- c. Andhra Pradesh
- d. Rajasthan

59. What will be the value of b , for which the least value of quadratic function $f(x) = x^2 - 4bx + 9$ is -27 ? (+1, -0.33)

- a. 6 or -6
- b. 3 or -3
- c. 4.5 or -4.5
- d. 4 or -4

60. Who is known as the father of DNA fingerprinting in India? (+1, -0.33)

- a. P.S. Rao
- b. Mukesh Sharma
- c. Sir Alec Geoffrey
- d. Lalji Singh

61. Find the next word in the series. (+1, -0.33)

L12O, N14M, P16K, _____.

- a. I18R
- b. R19I

c. R18I

d. I19R

62. The value of the conductor force is equal to ϵ : _____. (+1, -0.33)

a. $\epsilon = Q/t$

b. $\epsilon = E/Q$

c. $\epsilon = P/Q$

d. $\epsilon = W/Q$

63. Which one of the following does not contain water in alkali crystallization? (+1, -0.33)

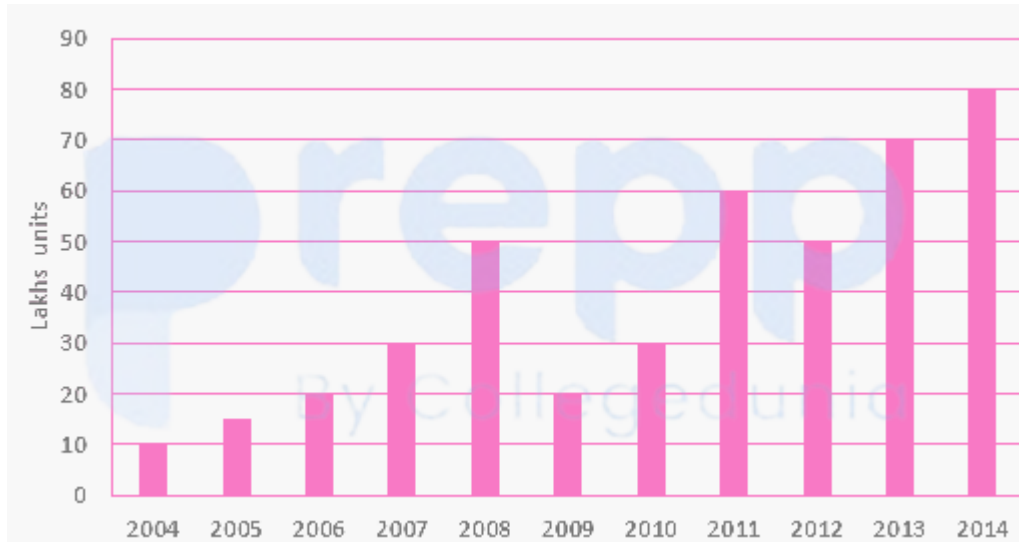
a. Baking soda

b. Blue vitriol

c. Washing soda

d. Gypsum

64. The following bar graph shows the information of personal computers sold by the company "XYZ" in the last 10 years. (+1, -0.33)



How many personal computers (In lakhs) did XYZ sell in the year 2006?

- a. 20
- b. 15
- c. 30
- d. 10

65. The length of the base of a triangle is $\frac{5}{7}$ of the base of a parallelogram. (+1, -0.33)
The area of the triangle and the parallelogram is the same. Find the ratio of the respective heights of the triangle and the parallelogram.

- a. 5 : 3
- b. 7 : 5
- c. 14 : 5
- d. 21 : 10

66. Find the minimum number of parallelograms in the given figure. (+1, -0.33)



- a. 47
- b. 45
- c. 39
- d. 51

67. A person received 4 packets in January with an average weight of 300g, and 8 packets in February with an average weight of 400g. What will be the average weight (in g) of all the packets received by the person in both months? (+1, -0.33)

- a. 412.67g
- b. 376.67g
- c. 350g
- d. 366.67g

68. In which year did the Right to Information come into force? (+1, -0.33)

- a. 2004
- b. 2005
- c. 2002

d. 2000

69. How many multiples of the number $2^{13} \times 3^5 \times 5^3 \times 7^6$ are perfect cubes or complete cubes? (+1, -0.33)

a. 24

b. 60

c. 36

d. 48

70. What is hemophilia? (+1, -0.33)

a. It is a disease caused by the absence of genes responsible for the factors that cause blood clotting.

b. It is a disease in which white blood cells become cancerous and eliminate RBCs in blood.

c. It is a disease that is caused by vitamin deficiency.

d. It is a disease in which extra hemoglobin is produced.

71. Assuming the given statements to be correct, which option is definitely correct? (+1, -0.33)

1. Some cats have two legs.

2. All men have two legs.

3. All monkeys are men.

- a. All monkeys have two legs.
- b. Some monkeys are not cats.
- c. Some men are cats.
- d. All men have four legs.

72. Read the given statement and decide which of the following assumptions (+1, -0.33) are contained in the statement.

Statement:

"Please note that the company will only provide accommodation to outside candidates if selected."

Assumptions:

- I. The company plans to select only external candidates.
 - II. The second company plans to select only local candidates.
- a. Neither assumption I nor II are implicit.
 - b. Only assumption I is implicit.
 - c. Either assumption I or II is implicit.
 - d. Only assumption II is implicit.

73. The density of a substance is defined as _____. (+1, -0.33)

- a. Mass per unit volume
- b. Product of mass and acceleration

- c. Weight per unit volume
 - d. Thrust unit area
-

74. In August 2018, India and which country signed the 'Second Protocol' amending the Comprehensive Economic Cooperation Agreement (CERA) to promote trade relations between the two? (+1, -0.33)

- a. America
 - b. South Korea
 - c. Singapore
 - d. China
-

75. In a solution made by dissolving 50 grams of sugar in 150 grams of water, the concentration of mass will be _____. (+1, -0.33)

- a. 48.2%
 - b. 3%
 - c. 25%
 - d. 50%
-

76. Which of the following, a major film actor, has been selected for the prestigious award in France called 'Knight of the Order of Arts and Letters'. (+1, -0.33)

- a. Kamal Hassan
- b. Shabana Azmi

- c. Rajinikanth
 - d. Anupam Kher
-

77. In which state is the Singareni Mines located? (+1, -0.33)

- a. Odisha
 - b. Telangana
 - c. Maharashtra
 - d. Chhattisgarh
-

78. What is the largest 4 digit number divided by 6, 9, 12, 13, and 15? (+1, -0.33)

- a. 9100
 - b. 9360
 - c. 9240
 - d. 9326
-

79. Who among the former wicket-keepers of India was appointed the new General Manager (GM) of the Board of Controller of Cricket in India (BCCI)? (+1, -0.33)

- a. Saba Karim
- b. Sunil Gavaskar
- c. Ravi Shastri

d. MV Sridhar

80. Two people are cycling in the same direction respectively, from there a train traveling at the fixed speed passes from the same direction. The train crosses the first in 8 seconds and the second in 8.4 seconds, the first one was cycling at a speed of 9 km/h while the second one was cycling at a speed of 12 km/h. What is the speed of the train in km/h? (+1, -0.33)

a. 72

b. 75

c. 81

d. 66

81. A person starts walking in the direction of the rising sun, he turns at 45° to his left and walks 500 meters after that he turns at 90° to his left and walks for a while. Which direction is he facing now? (+1, -0.33)

a. West

b. North

c. North - West

d. North - East

82. The statement is followed by two arguments. State which argument is correct about the statement. (+1, -0.33)

Statement: There are many aspects to a person.

Argument:

1. Yes, everyone responds to a situation that is different from the other
 2. No, we are responsible for what we create all around us. What we produce happiness or sorrow is up to us.
- a. Only argument 2 is correct.
 - b. Either argument 1 or 2 is correct
 - c. Only argument 1 is correct.
 - d. Neither 1 nor 2 is correct.
-

83. Indian cricket captain Virat Kohli married which film actress in 2017? (+1, -0.33)
- a. Kriti Sanon
 - b. Anushka Sharma
 - c. Kangana Ranaut
 - d. Parineeti Chopra
-

84. On body work is done only when: _____. (+1, -0.33)
- a. Forces act on it.
 - b. It provides energy boost through a mechanical effect.
 - c. Displacement takes place there.
 - d. It moves through a certain distance.
-

85. What is the square root of 21904? (+1, -0.33)
-

- a. 144
 - b. 146
 - c. 152
 - d. 148
-

86. What was India's total medals in the 2018 Commonwealth Games? (+1, -0.33)

- a. 58
 - b. 59
 - c. 66
 - d. 61
-

87. What is the film-on-wheel concept of 'UFO Movies India' called? (+1, -0.33)

- a. E-cinema
 - b. E-Talkies
 - c. Caravan Talkies
 - d. Caravan Cinema
-

88. The SI unit of potential difference is _____. (+1, -0.33)

- a. Watt
- b. Volt

c. Coulomb

d. Jule

89. It is Sunday on 30 September 2018. Which of the following year will also be Sunday on 30th September? (+1, -0.33)

a. 2024

b. 2029

c. 2027

d. 2023

90. Find the next alphanumeric in the following series. (+1, -0.33)

11KI9, 16PN14, _ _ _ _ _

a. Q18S19

b. 21US19

c. 21VS19

d. 22US19

91. One pascal = ? (+1, -0.33)

a. 1 N m^{-2}

b. 1 N m^2

c. 1 dyne cm^{-2}

d. 100 atmosphere

92. The ratio of the two numbers is 17 : 28. If 6 is added to the smaller number, (+1, -0.33)
then the ratio changes to 13 : 20. What is the value of a larger number?

a. 112

b. 98

c. 140

d. 126

93. What is the product produced as a result of thermal decomposition of (+1, -0.33)
lead nitrate?

a. Lead oxide + nitrogen trioxide + nitrogen trioxide

b. Lead oxide + nitrogen dioxide

c. Lead oxide + oxygen + nitrogen dioxide

d. Lead oxide + nitrogen trioxide

94. In triangle ABC, point M is on side AB and point N is on side AC such that (+1, -0.33)
BMNC becomes a trapezium. The ratio of side MN and side BC is 7 : 9.
Calculate the ratio of the area of triangle AMN and the area of trapezium
BMNC.

a. 7 : 9

b. 49 : 32

c. 32 : 49

d. 49 : 81

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

Statement: All jaguars are cheetahs, all panthers are cheetahs

Conclusion:

1. All Jaguars are Panthers.
 2. Some Jaguars are Panthers.
- a. Both 1 and 2 follow
 - b. Neither 1 nor 2 follows
 - c. Only conclusion 1 follows
 - d. Only conclusion 2 follows.

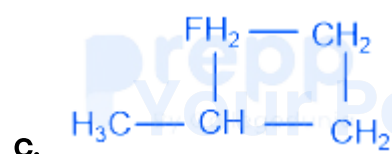
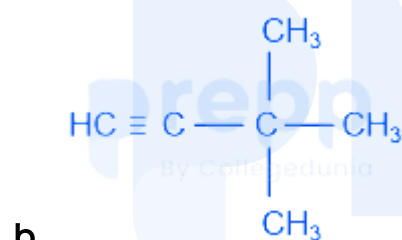
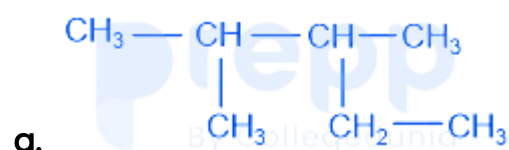
-
96. _____ tissue is the only plant tissue that produces new cells by cell division. (+1, -0.33)

- a. Parenchyma
- b. Xylem
- c. Collenchyma
- d. Meristematic

-
97. The difference between 33% loss and 7% profit on selling an item is Rs 220. (+1, -0.33)
What is the cost price of the item?

- a. Rs. 550
- b. Rs. 525
- c. Rs. 600
- d. Rs. 575

98. Which of the following is an unsaturated compound? (+1, -0.33)



99. In which of the following is the body of the plant differentiated into roots, stems and leaves? (+1, -0.33)

- a. Funaria
- b. Chara

c. Marsilea

d. Marchantia

-
100. If A means addition, E means division, I means subtraction, O means multiplication and the remaining letters are replaced with numbers according to their chronological position (used as mathematical notation If the letters formed to retain their number in the series), what will be the result of the following? (+1, -0.33)

88E11A2I4 = ?

a. 60

b. 33

c. 12

d. 6

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Answers

1. Answer: b

Explanation:

Concept used:

A **finite decimal** or **terminating decimal** is a decimal representation of a number whose digits after decimals has an end.

e.g. $1/5 = 0.2$

Calculations:

Considering option 1,

$$1/24 = 0.04166...$$

Considering option 2,

$$1/32 = 0.03125$$

Considering option 3,

$$1/96 = 0.0104166...$$

Considering option 4,

$$1/48 = 0.020833...$$

∴ The finite decimal or terminating decimal is $1/32$.

★ Additional Information

A **repeating decimal** or **recurring decimal** or **infinite decimal** is a decimal representation of a number whose digits are periodic (repeating its values at regular intervals) and the infinitely repeated portion is not zero.

e.g. $1/3 = 0.3333...$

2. Answer: a

Explanation:

Given:

$$\text{LCM} = 3 \times \text{HCF}$$

Concept used:

If a and b are two numbers, then $a \times b = \text{HCF} \times \text{LCM}$

Calculations:

Let the numbers and HCF be a , b and y respectively.

$$a \times b = \text{HCF} \times \text{LCM}$$

$$\Rightarrow a \times b = y \times 3y$$

$$\Rightarrow ab = 3y^2$$

$$\text{HCF} \times \text{LCM} = 867$$

$$\Rightarrow y \times 3y = 867$$

$$\Rightarrow 3y^2 = 867$$

$$\Rightarrow y^2 = 867/3$$

$$\Rightarrow y^2 = 289$$

$$\Rightarrow y = 17$$

As we have given,

$$\text{LCM} = 3 \times 17 = 51$$

So,

$$a \times b = 17 \times 51$$

As the only possible pair of numbers is 17 and 51 according to the given condition, we can say,

$$a = 17 \text{ and } b = 51.$$

$\therefore$ The numbers are 17 and 51.

★ Shortcut Trick

The question can be solved by just checking the condition from the options.

From option 1, we can see that LCM of 17 and 51 is 51 and HCF is 17.

Which is satisfying the condition that $LCM = 3 \times HCF$.

$$\text{Also, } 17 \times 51 = 867.$$

$\therefore$ Option 1 is the correct answer.

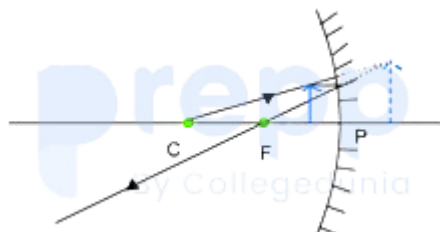
3. Answer: a

Explanation:

The correct answer is Virtual.

★ Key Points

- When the **object** is placed between the principal focus (F) and the pole of a concave mirror, an enlarged, virtual and erect image is formed behind the mirror.



- The position of the image is **behind the mirror**.
- The image will be **Enlarged, Virtual, Erect**.

4. Answer: a

Explanation:

Given,

8 December 2007 was a Saturday, then what was the day on 12 August 2008.

Here we see the number of odd days from 8 December 2007 to 12th August 2008 are,

Total number of days,

8th December 2007 to 31th December = 23 days

January 2008 = 31 days

February 2008 = 29 days

March 2008 = 31 days

April 2008 = 30 days

May 2008 = 31 days

June 2008 = 30 days

July 2008 = 31 days

August 2008 = 12 days

$\therefore$ Total number of days = $23 + 31 + 29 + 31 + 30 + 31 + 30 + 31 + 12 = 248$

$\therefore$ Number of odd days = $248 \div 7 = 3$ odd days

Saturday + 3 odd days = Tuesday

$\therefore$ The 12th August 2008 was Tuesday

Hence, the correct answer is Tuesday.

5. Answer: d

Explanation:

Given:

$$x + y = 2$$

$$x - y = 6$$

Formula used:

$$x^2 - y^2 = (x + y)(x - y)$$

Calculation:

$$x^2 - y^2 = 2 \times 6$$

$$\Rightarrow 12$$

Which means both 1 and 2 are sufficient to find the required value

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6. Answer: c

Explanation:

Given,

Hand, Nose, Heart, Eyes

Here we see all the body parts are external except the heart.

The heart is internal body part therefore it is odd or mismatch from others.

Hence, the correct answer is the heart.

7. Answer: d

Explanation:

The correct answer is The fraction of molecules increases with the most possible speed.

★ Key Points

- On **increasing the temperature**, the motion of the gas molecules becomes rapid and hence the value of the most probable velocity also increases.
- As a result, the entire distribution curve becomes flatter, and peak shifts to regions of higher velocities
- As the temperature of the gas increases, the particles **gain kinetic energy, and their speed increases.**
 - The most probable speed is **directly proportional to the square root of temperature.**
- The area under the **distribution curve remains the same as under the lower temperature.**
 - The total area under the curve is **independent of the temperature.**
 - The area under the **distribution curve represents the total number of molecules.**

8. Answer: b

Explanation:

The correct answer is Malabar.

★ Key Points

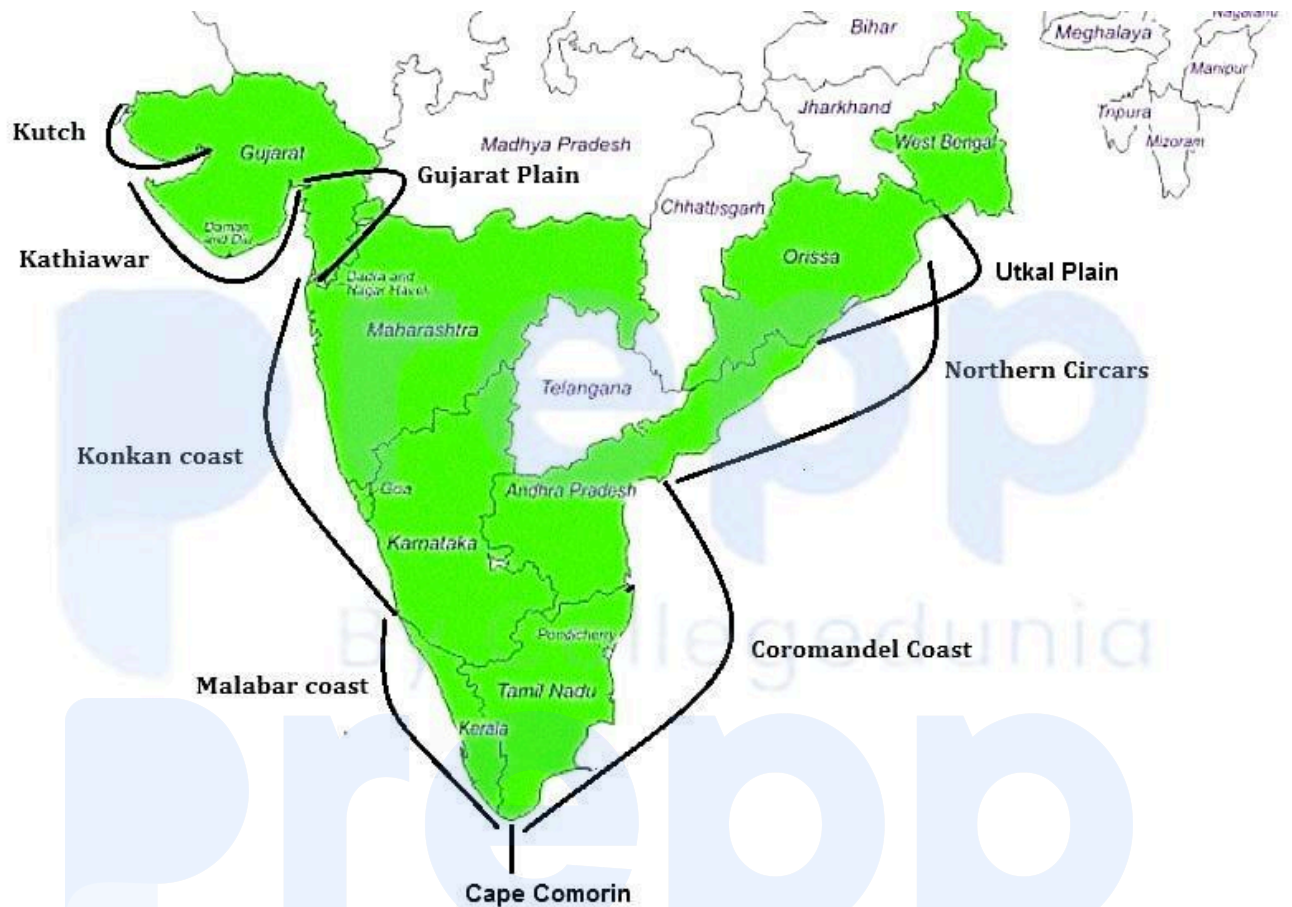
- The **Malabar coast in Kerala** is a beautiful **backwater** lined with **coconut trees**.
- Backwaters in Kerala are a network of **1500 km of canals both artificial and natural, with 38 rivers and 5 big lakes** extending from one end of Kerala.

- Malabar Coast, a name long applied to **the southern part of India's western coast, is approximately from the state of Goa southward** , which is bordered on the east by the Western Ghats range.

★ Important Points

Khambhat	• It is a town in Gujarat's Anand district. • The Gulf of Khambhat, also known as the Gulf of Cambay, is a bay on the Arabian Sea coast of India, bordering the state of Gujarat right north of the city of Mumbai.
Konkan	• It is also called Aparanta, the coastal plain of western India, lying between the Arabian Sea (west) and the Western Ghats (east).
Coromandel	• The Coromandel Coast is the southern part of India's east coast. • They are commonly used to refer to the whole coastline from Kanyakumari to the Krishna river delta.

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9. Answer: a

Explanation:

The correct answer is Bharat Watwani.

★ Key Points

- Bharat Watwani and Sonam Wangchuk were won the Ramon Magsaysay Award 2018.
- Bharat Vaswani was recognized for his tremendous courage and healing compassion in embracing India's mentally-afflicted destitute.
- Sonam Wangchuck's initiative to harness science and culture creatively for economic progress improved the lives of the Ladakhi youth.

★ Important Points

- The Ramon Magsaysay Award, Asia's premier prize, and highest honor celebrate the greatness of spirit and transformative leadership in Asia.
- The Award is presented to them in formal ceremonies in **Manila, the Philippines on August 31st**, the **birth anniversary** of the much-esteemed **Philippine President** whose ideals inspired the Award's creation in **1957**.

★ Additional Information

- In **2019**, **Ravish Kumar** an Indian Journalist, author, and media personality got this prestigious award.
- Human rights activist, **Vinoba Bhave** was the **1st Magsaysay Award winner** in **1958**.
- In the year **2000**, **Aruna Roy** got this award in the field of **Community Leadership**.
- In the year **2001**, **Rajendra Singh** got this award in the field of **Community Leadership**.
- In the year **2008**, **Prakash Amte** got this award in the field of **Community Leadership**.

10. Answer: d

Explanation:

Calculation:

$$4.5 + 0.45 + 0.045 + 0.0045 = ?$$

$$\Rightarrow 4.9995$$

∴ The required value is 4.9995

11. Answer: a

Explanation:

Calculation:

$$(11/13) + (13/11) = ?$$

$$\Rightarrow \text{LCM of 13 and 11} = 143$$

$$\text{So, } [(11 \times 11) + (13 \times 13)]/143 = ?$$

$$\Rightarrow [121 + 169]/143 = ?$$

$$\Rightarrow 290/143 = ?$$

$\therefore$ The value of ? is 290/143

12. Answer: c

Explanation:

The correct answer is Lucknow.

★ Key Points

- The largest school in terms of pupils is the **City Montessori School** in Lucknow, Uttar Pradesh, India, which had **55,547** pupils as of 16 January 2019 across 18 campuses in the city.

★ Additional Information

- The school was founded by **Dr. Jagdish Gandhi** and his wife **Dr. Bharti Gandhi**.
 - The pair launched their first campus in **1959** in rented premises with only **five students**.
- **City Montessori School** is celebrating its **Diamond Jubilee** in 2019.
- The school was the recipient of the **2002 UNESCO Prize** for **Peace Education** – the **only school** ever to have received this award.

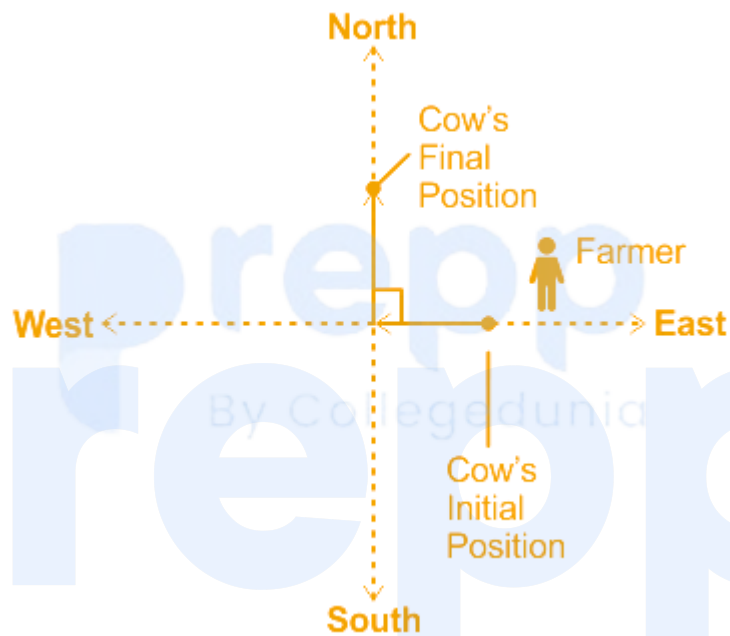
13. Answer: a

Explanation:

Given,

The farmer left a cow to walk west. The cow started grazing. After some time, the cow started moving to its right and reached a position that was 90 degrees from its starting position.

∴



Here we see cow is facing **North** direction.

Hence, the correct answer is North.

14. Answer: d

Explanation:

Now, let the quantity of Zinc to be added be y kg

The initial total quantity of German Silver is 54 kg

Hence, we can obtain the initial quantities of the various metals as:

Sr. No.	Metal	Metal Quantity (in kg)
1	Copper	$[4/(4 + 3 + 2)] \times 54 = 24$
2	Zinc	$[3/(4 + 3 + 2)] \times 54 = 18$
3	Nickel	$[2/(4 + 3 + 2)] \times 54 = 12$

After y kg of zinc is added, the ratio of copper, zinc and nickel becomes 2 : 5 : 1.

So, let the new respective quantities of these metals be 2x, 5x, and x respectively.

Hence, $x = 12$

Therefore, the new quantity of zinc becomes:

$$18 + y = 5x \quad \text{-----(i)}$$

On substituting the value of $x = 12$ into the equation (i), we get:

$$y = (5 \times 12) - 18 = 42$$

$\therefore$ The required quantity of zinc to be added is 42 kg

15. Answer: c

Explanation:

Given:

Time taken to fill a completely empty tank by pipe M = 45 hours

Time taken to empty a completely filled tank by pipe N = 90 hours

Concept Used:

If a pipe takes M hours to fill a completely empty tank, then the part of the tank filled by the pipe in 1 hour = $1/M$

Similarly, if a pipe takes N hours to empty a completely empty tank, then the part of the tank emptied by the pipe in 1 hour = $1/N$

But, the work done is negative while emptying the tank

Calculation:

Using the given conditions along with the concept used, we get:

Part of the tank filled by the pipe M in 1 hour = $1/45$

Part of the tank emptied by the pipe N in 1 hour = $1/90$

So, when both these tanks work together, the part of the tank they fill in one hour is obtained as:

$$1/45 - 1/90 = 1/90$$

Hence, the time taken by both the pipes to together fill the tank is obtained as:

$$1/(1/90) = 90 \text{ hours}$$

Also, the time taken to fill the half empty tank completely, is obtained as:

$$90/2 = 45 \text{ hours}$$

$\therefore$ The time the two pipes take to together fill the half empty tank completely is 45 hours

16. Answer: a

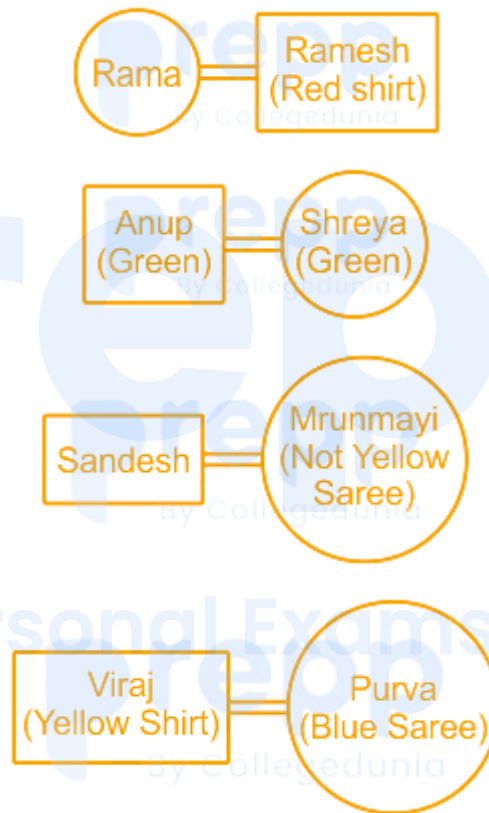
Explanation:

Given,

Four couples go to a party. All the women are wearing different colour sarees. All men are wearing different coloured shirts. The colour of a shirt and a saree can be the same. Consider all the statements given below and answer the questions.

Statement:

1. Rama is married to Ramesh who is wearing a red shirt.
2. Purva, who is not Anup's wife, is wearing a blue sari.
3. Anup and Shreya are wearing green clothes.
4. Sandesh's wife Mrunmayi has not worn a yellow sari.
5. Vijay is wearing a yellow shirt.



Here we see Anup is Shreya's husband.

Hence, the correct answer is Anup.

17. Answer: b

Explanation:

The correct answer is Sublimation.

★ Key Points

- Sublimation is the conversion between the solid and the gaseous phases of matter, with no intermediate liquid stage .
 - Example: Snow and ice changing into water vapor in the air without first melting into water .

★ Important Points

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Distillation	- Distillation is a procedure by which two mixed liquids with different boiling points can be separated. - It is an important separation process in chemistry, industry, and food science. - Distillation involves boiling a liquid, then condensing the gas and collecting the liquid elsewhere. - A liquid is boiled in the "distilling flask", then the vapors travel to another section of the apparatus where they come into contact with a cool surface.
Crystallization	- It is a process by which a chemical is converted from a liquid solution into a solid crystalline state. - Crystallization acts as both separation and purification steps. - The crystallization process consists of two major events: - Nucleation. - Crystal Growth.
Filtration	- Filtration is the process of separating suspended solid matter from a liquid. - The liquid which has passed through the filter is called the filtrate. The filter may be paper, cloth, cotton-wool, asbestos, slag- or glass-wool, unglazed earthenware, sand, or other porous material.

★ Additional Information

- The **opposite of sublimation is "deposition"** , where water vapor changes directly into the ice—such as **snowflakes and frost**.

18. Answer: b

Explanation:

The correct answer is C₄H₁₀.

★ Key Points

- Compounds with different physical properties were found to have the **same elemental composition and molecular weight** . Such compounds were called isomers.
- The below table shows the number of constitutional isomers for each of the **acyclic alkanes C_nH_{2n+2}** , where n=1-10 .
- The molecular formula of isobutane **C₄H₁₀**.

★ Additional Information

- If the **number of carbon atoms increases** , the **number of possible constitutional isomers increases rapidly** .

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Acyclic Alkane	Number of Carbons	Number of Isomers
methane	1	1
ethane	2	1
propane	3	1
butane	4	2
pentane	5	3
hexane	6	5
heptane	7	9
octane	8	18
nonane	9	35
decane	10	75

19. Answer: b

Explanation:

Given:

$$16^3 \div 8^3 \div 2^2 = ?$$

Concept used:

$$x^a \div x^b = x^{(a - b)}$$

$$x^a \times x^b = x^{(a + b)}$$

Calculation:

$$\Rightarrow (2^4)^3 \div (2^3)^3 \div 2^2 = ?$$

$$\Rightarrow 2^{12} \div 2^9 \div 2^2 = ?$$

$$\Rightarrow 2^3 \div 2^2 = ?$$

$$\Rightarrow 2^1 = ?$$

$\therefore$ The value of ? is 2^1

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20. Answer: b

Explanation:

The correct answer is the f – Block element.

★ Key Points

- There are **thirty** total elements in the lanthanides and actinides. They are often called the "**inner transition metals**".
- **Lanthanides** :
 - The lanthanides are the elements with atomic numbers from **57 to 71**.

- These **15 metals (along with scandium and yttrium)** are often called the **rare earth elements**.
- They are all silvery-white metals that are often found in the same ores.
- They are called the lanthanides because they **exhibit similar chemical properties to lanthanum, the first element in the group**.
- **Actinides :**
 - Actinides are the **15 elements** with atomic numbers from **89 to 103**.
 - They are named after the **first element in the series, actinium**.
 - The actinides group includes mostly man-made elements with only a few exceptions such as uranium and thorium.
 - The actinides are most known for the elements **uranium and plutonium** which are used in **nuclear reactors and nuclear bombs**.

★ Additional Information

- The **actinide americium** is used in **smoke detectors**.
- Both actinides and lanthanides are **highly reactive with elements from the halogen group**.
- All of the lanthanides have at **least one stable isotope except for promethium**.
- None of the actinides have a stable isotope. They are all **radioactive**.

Table: Modern Periodic table

Legend:

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

The zig zag line separates the metals from the non metals

GROUP NUMBER		Transition Metals										GROUP NUMBER						18	
PERIODS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	1 H	2 He																	
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr	
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe	
6	55 Cs	56 Ba	57 La*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn	
7	87 Fr	88 Ra	89 Ac**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og	

*Lanthanoides 6	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
**Actinoides 7	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

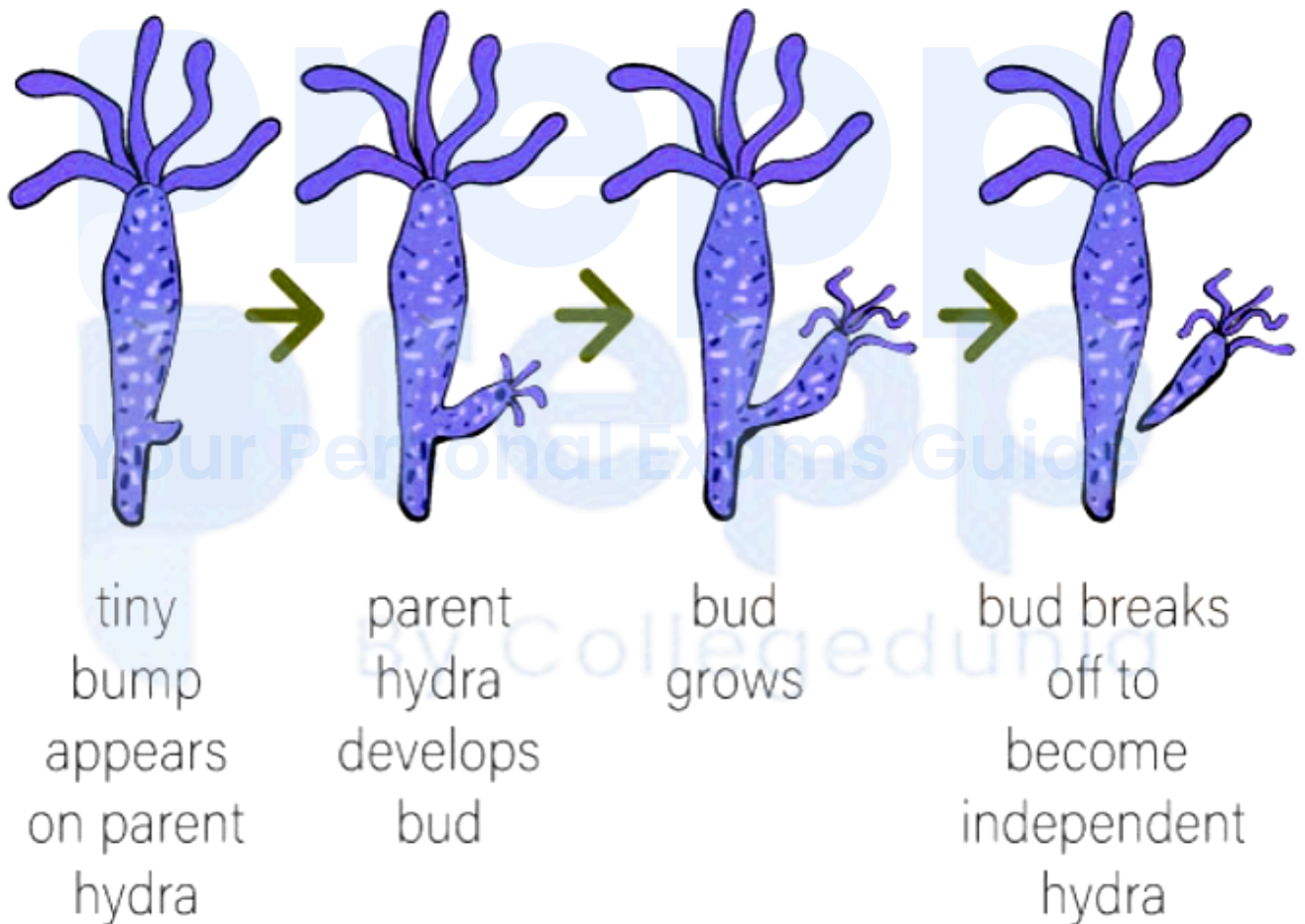
21. Answer: c

Explanation:

The correct answer is Hydra.

★ Key Points

- Organisms such as **hydra** use **regenerative cells** for reproduction in the **process of budding**.
- **Budding**, in biology, a form of **asexual reproduction** in which a new individual develops from some generative **anatomical point of the parent organism**.



Confusion Points

- Hydra and Yeast both use Budding for reproduction.
- But Hydra uses its regenerated cells, it will regenerate upon being cut into pieces, but the yeast will not survive and will simply die.

★ Additional Information

- Yeast is **single-celled microorganisms** that are classified, along with **moulds and mushrooms**, as members of the Kingdom **Fungi**.
 - It is called **Saccharomyces cerevisiae**, which needs food, warmth, and moisture to thrive.
 - It converts its food—s **ugar and starch** —through **fermentation**, into **carbon dioxide and alcohol**. It's the carbon dioxide that makes baked goods rise.
- **Planarian flatworms** are well known for their amazing regenerative capacity that live in freshwater.
 - It depends on the presence of **stem cells called neoblasts**.
- **Amoebae are eukaryotes protozoans** of the rhizopodan order Amoebida.
 - It is found on **decaying bottom vegetation of freshwater streams and ponds**.
 - Amoeba can be both **fungi, animals, and algae**.

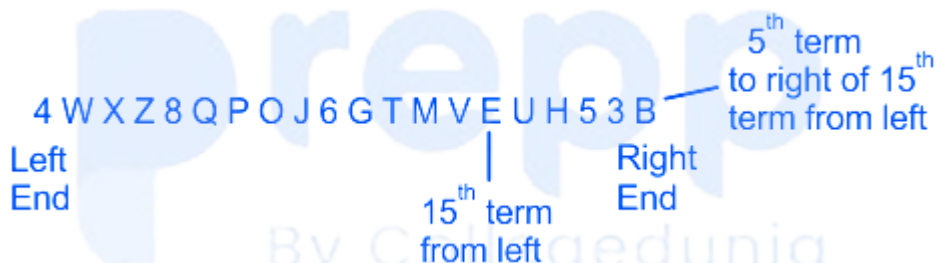
22. Answer: c

Explanation:

Given,

4 W X Z 8 Q P O J 6 G T M V E U H 5 3 B

∴

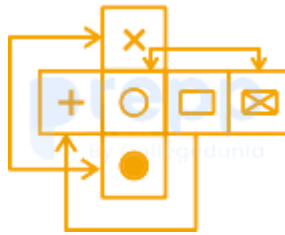


Here we see B is the 5th term to the right of 15th term from the left.

Hence, the correct answer is B.

23. Answer: d

Explanation:



The opposite faces of the cube are,



As Two opposite faces are never seen together or adjacent to each other:

In Option Figure 1 :- Dark circle and cross are opposite faces but here they are seen together which is wrong.

In Option Figure 2 :- Dark circle and cross are opposite faces but here they are seen together which is wrong.

In Option Figures 4 none of the opposite faces are seen together nor they are adjacent to each other.

Thus option figure 4 can be formed by folding the dice.

∴ The correct representation is



Hence, the correct answer is option 4).

24. Answer: b

Explanation:

★ Important Points

- The reflection of an object into the water is its water image.
- It appears by inverting an object vertically i.e. upside down.
- The water image of the figure looks like the mirror image of the figure in case the mirror is horizontally at the bottom of the figure.

Given, 91238769AZ

In the water image, the left and right part of the figure remains the same and the top and bottom part of the figure changes.

∴

91238769AZ

=====

91238769AZ

Hence the correct answer is

91238769AZ

25. Answer: d

Explanation:

The correct answer is 519 meters.

Speed of Sound = 346 ms^{-1} (A)

Time is taken to echo the be heard = 3 second

- Let's consider the distance between the boy and rock = d

Now, In order to echo to be heard the sound had to 1st travel to the rock and then come back.

- This means the sound has to cover distance = 2d

According to the question, Time is taken to travel 2d distance = 3 s

So, Time to travel distance d = 3/2 sec (B)

Now, **Distance = Speed × Time**

$$= 346 \text{ ms}^{-1} \times 3/2 \text{ s [From (A) and (B)]}$$

$$= 519 \text{ m}$$

So, the distance between the boy and the rock(d) = 519 m

26. Answer: c

Explanation:

The correct answer is Both 1 and 2 follow.

★ Key Points

- The **consociational theory** challenges the two paradigmatic notions that **democracy** should be equated with **majority rule** and that democracy is not a viable form of government in deeply divided societies.
- The **essence of democracy is majority rule**, the making of binding decisions by a vote of **more than one-half** of all persons who participate in an election.
- Articles of the Indian Constitution can be amended by a simple **majority in the Parliament (Second Schedule, Article 100(3), 105, 11, 124, 135, 81, 137)**.
 - It is **not less than two-thirds of the members of each House** present and voting and a majority of the total membership of each House.

27. Answer: a

Explanation:

The correct answer is **minutes before 11 o'clock**.

At 10 o'clock the hour hand is at 10 and the minute hand is at 12.

∴ The minute and hour hand of a clock overlap somewhere between 10 and 11.

That is minutes before 11 o'clock.

Hence the correct answer is **minutes before 11 o'clock**.

28. Answer: d

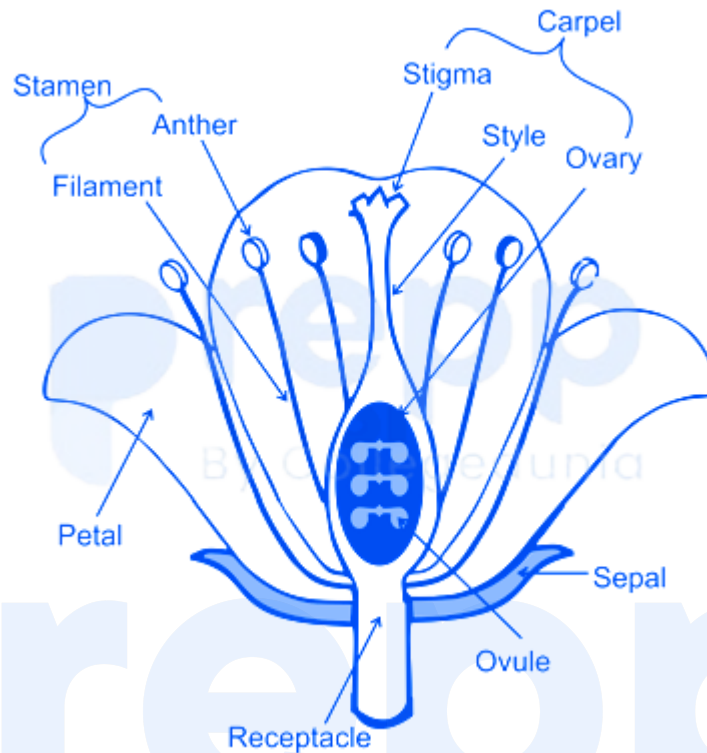
Explanation:

The correct answer is **Thalamus**.

★ **Key Points**

- A flower is the sexual reproductive organ in plants it consists of four basic parts:
 - **Sepal** – is the outer part of the flower (often green and leaf-like) that encloses a developing bud. It is a defensive organ that encloses and protects the developing reproductive structures.
 - **Petal** – is the part of a flower that is often conspicuously coloured.
 - **Stamen** – is the pollen-producing part of a flower, usually with a slender filament supporting the anther.
 - **Pistil** – is the female reproductive part that consists of stigma, style and ovary.
- **Thalamus** –
 - It is also known as the **receptacle**.
 - It is usually the **slightly swollen part of the pedicel or stalk** of the flower.

- It is the **basis on which all the floral parts are present.**



★ Additional Information

- **Placenta** – In a flower, placenta is the connection between the ovules in an ovary. While, in human reproduction placenta is a structure that develops in the uterus to provide nutrients to the developing fetus.
- **Fallopian Tube** – is a part of human reproductive system which connects the ovary to the uterus.

29. **Answer: c**

Explanation:

The correct answer is Momentum and force.

★ Important Points

- Option (a), Speed = Distance / time = ms^{-1}
Velocity = Displacement / time = ms^{-1}
Thus both have the same unit.
- Option (b), Gravity (g) = ms^{-2}
Acceleration due to gravity = ms^{-2}
Thus, both have the same unit.
- Option (c), Momentum = Mass * Velocity = $\text{Kg} * \text{ms}^{-1} = \text{Kgms}^{-1}$
Force = Mass * Acceleration = $\text{Kg} * \text{ms}^{-2} = \text{Kgms}^{-2}$
Thus the unit of Momentum and force is not the same.
- Option (d), Distance = m(meter)
Displacement = m(meter)
Thus both have the same unit.

30. Answer: d

Explanation:

The correct answer is 0,1.

★ Key Points

- Formula for speed after impact
 - $v_a = [m_a u_a + m_b u_b + m_b C_R (u_b - u_a)] / (m_a + m_b)$ {1}
 - $v_b = [m_a u_a + m_b u_b + m_a C_R (u_a - u_b)] / (m_a + m_b)$ {2}
- Where,
 - v_a = Velocity of a after impact
 - v_b = Velocity of b after impact
 - u_a = Velocity of a before impact
 - u_b = Velocity of b before impact
 - C_R = Coefficient of restitution
 - M_a = mass of object a
 - M_b = Mass of object b

- Let us consider
 - Object a = ball and object b = gate
- Now given in question:
 - $u_a = 2\text{m/s}$
 - $u_b = 0\text{ m/s}$
 - Let, $M_b = x$ the $m_b = 2x$
 - $C_R = 0.5$
- Now putting the values in equation {1}
 - $v_a = [2x + 2x * 0 + 2x * 0.5(0 - 2)] / x + 2x$
 - $= [2x - x * 2] / 3x$
 - $= [2x - 2x] / 3x$
 - $= 0 / 3x\text{ m/s}$
 - $= 0\text{ m/s}$
 - $v_b = [2x + 2x * 0 + x * 0.5(2 - 0)] / (x + 2x)$
 - $= [2x + 0 + x] / 3x$
 - $= 3x / 3x$
 - $= 1\text{ m/s}$
- So, after impact speed of
 - Ball = $v_a = 0\text{ m/s}$
 - Gate = $v_b = 1\text{ m/s}$
 - Thus the answer is **0, 1**.

31. Answer: c

Explanation:

The correct answer is Saraswati.

★ Key Points

- The Saraswati River is one of the rivers mentioned in the **Rig Veda** and later **Vedic and post-Vedic texts** .

- Saraswati is the name of a river originating in the **Aravalli mountain range** in **Rajasthan** , passing through **Sidhpur and Patan** before submerging in the **Rann of Kutch desert** .

★ Important Points

- Sapta Sindhu is the seven rivers that are considered the most sacred ones in India: **Indus, Jhelum, Chenab, Ravi, Sutlej, Beas**.
- **Chenab River** , a river of the Indian subcontinent in **northwestern India and northeastern and eastern Pakistan** .
 - The Chenab is formed by the confluence of two streams, **Chandra and Bhaga** .
- The **Yamuna rises** on the slopes of the **Bandarpunch massif** in the **Great Himalayas near Yamnotri (Jamnotri)** in western **Uttarakhand** .
 - It is the **second-largest tributary river of the Ganga** and the **longest tributary in India** .
- **Jhelum River** , a river of **n orthwestern India and northern and eastern Pakistan** .
 - the source of this river is **Pir Panjal Range** and falls into the **Chenab River** .

32. Answer: a

Explanation:

Let the sum of Suraj be S,

Let the sum of Aditya be A, and

Let the sum of Ravi be R.

Hence, from the given conditions, we get:

$$S = 4R \quad \text{----(i)}$$

$$R = 16A$$

$$\Rightarrow A = R/16 \quad \text{----(ii)}$$

So, we can obtain the ratio of the sums of Aditya and Suraj as:

$$A/S = (R/16)/4R = 1/64$$

$\therefore$ The required ratio of the sums of Aditya and Suraj is 1 : 64

33. Answer: b

Explanation:

Given,

Question: Who among P, N, K and J get the highest payment?

Statement:

1. P earns more than K and J.

$P > K, P > J.$

2. N earns more than K.

$N > K.$

From both statement, the order of payment from highest to lowest is,

$P > N > K > J ; P > N > J > K$

or

$N > P > K > J ; N > P > J > K$

Here we see we don't know who gets the highest payment.

$\therefore$ Both statements are not correct.

Hence, the correct answer is Statements 1 and 2 both are not correct.

34. Answer: d

Explanation:

The correct answer is 250 J.

- Given, mass (m) = 20 kg, velocity (v) = 5 ms^{-1} .
Kinetic energy = $(\frac{1}{2})mv^2$
So, the kinetic energy of the object is $(\frac{1}{2}) \cdot 20 \cdot 5^2 = 250 \text{ J}$.

★ Key Points

- It is the **energy of an object's mass in motion**.
- When an objects' **mass doubles**, its kinetic energy also **doubles**.
- When an objects' **speed doubles**, its kinetic energy **quadruples**.
- When a pendulum **goes uphill (top point)**, it **loses kinetic energy**.

35. Answer: d

Explanation:

For the polynomial $3x^2 + ax - 12$ to be completely divisible by the polynomial $x - 8$, we need to satisfy the following condition:

The remainder should be 0, on dividing the former polynomial with the latter.

We take $x - 8$ as the divisor, and $3x^2 + ax - 12$ as the dividend.

$$\begin{array}{r}
 3x + 1.5 \\
 x-8 \overline{) 3x^2 + ax - 12} \\
 \underline{(-) 3x^2 \quad (+) 24x} \\
 (a + 24)x - 12 \\
 \underline{1.5x - 12} \\
 (-) \quad (+) \\
 (a + 24 - 1.5)x
 \end{array}$$

We obtain the remainder as:

$$(a + 22.5)x = 0$$

$$\Rightarrow a = -22.5$$

$\therefore$ The required value of a is -22.5

36. Answer: b

Explanation:

Calculation:

The series follows following pattern:

$$152 - 4 = 148$$

$$148 + 8 = 156$$

$$156 - 4 = 152$$

$$152 + 8 = 160$$

$\therefore$ The next term of series will be 160

37. Answer: b

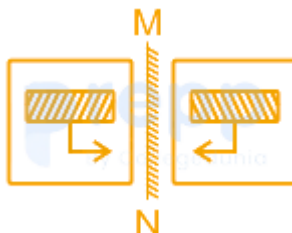
Explanation:

Given,



In the mirror image, the top and bottom part of the figure remains unchanged and left and right part of the figure changes.

∴



Hence, the correct answer is A.

★ Additional Information

In a mirror image Left changes to right and the right changes to left vice-versa.

When placement of mirror not given, By default we will assume it in Vertical direction.

The Letter adjacent to the mirror after the mirror image will adjacent to it just with the left change to right and right change to left vice-versa.

The starting letter of the word will be at last after the mirror image drawn with left changes to right and right changes to left.

38. Answer: c

Explanation:

Given:

Time taken by A and B to together complete the work = 7 days

Time taken by B and C to together complete the work = 8.75 days

Time taken by A to complete the work alone = 10.5 days

Concept Used:

If a person takes x days to complete a work, the part of the work completed by him in 1 day = $1/x$

Calculation:

Part of the work completed by A and B together in 1 day is obtained as:

$$(1/A) + (1/B) = 1/7 \quad \text{-----(i)}$$

Part of the work completed by B and C together in 1 day is obtained as:

$$(1/B) + (1/C) = 1/8.75 = 4/35 \quad \text{-----(ii)}$$

Part of the work completed by A alone in 1 day is obtained as:

$$1/A = 1/10.5 = 2/21 \quad \text{-----(iii)}$$

We substitute the value of $(1/A)$ into equation(i) to obtain:

$$(2/21) + (1/B) = 1/7$$

$$\Rightarrow 1/B = 1/21 \quad \text{-----(iv)}$$

Hence, B takes 21 days to complete the work alone

Now, we substitute the value of $(1/B)$ into equation(ii) to obtain:

$$(1/21) + (1/C) = 4/35$$

$$\Rightarrow 1/C = (4/35) - (1/21) = 1/15$$

Hence, the time required by C to complete the work alone = 15 days

So, the time C will need to complete double the amount of work will be:

$$2 \times 15 = 30 \text{ days}$$

$\therefore$ The time C will take to complete double the same amount of work, when working alone, will be 30 days

39. Answer: c

Explanation:

Given,

Gun, Sword, Write, Spade

Here we see all are tools except Write.

Write is a process in which one can communicate.

Hence the correct answer is Write.

40. Answer: c

Explanation:

The correct answer is Period.

★ Key Points

- All elements can be classified into one of three classes: metals, metalloids, or nonmetals.
- Elements in each class share certain basic properties. From left to right across each period of the periodic table, elements change from metals to metalloids to nonmetals.

★ Important Points

- Ionization energy increases on going from left to right and from down to top.
- Electron affinity increases on going from left to right and from down to top.
- The atomic radius increases from right to left and top to bottom
- The atomic radius decreases moving from left to right in the Modern Periodic Table.
- No of valance electron increases as we go left to right in a period.

★ Additional Information

- A **group** is a **vertical column** of the periodic table, based on the **organization of the outer shell electrons**.
- There are a total of **18 groups**.
- Elements with **similar chemical properties appear at regular intervals, within the vertical columns**.
- A period is a **horizontal row** of the periodic table.
 - There are **seven periods** in the periodic table, with each one beginning at the far left.
 - A new period begins **when a new principal energy level begins filling with electrons**.
 - **Period 1** has only **two elements (hydrogen and helium)**.
 - **Periods 2 and 3** have **8 elements**.
 - **Periods 4 and 5** have **18 elements**.
 - **Periods 6 and 7** have **32 elements**.
- Group can be used to characterize an element:
 - **Group 1: alkali metals, or lithium family**
 - **Group 2: alkaline earth metals, or beryllium family**
 - **Group 3: the scandium family**
 - **Group 15: the pnictogens, or nitrogen family**
 - **Group 16: the chalcogens, or oxygen family**
 - **Group 17: the halogens, or fluorine family**
 - **Group 18: the helium/neon family. These included the Nobel gases for the first six periods**

Table: Modern Periodic table

The zig zag line separates the metals from the non metals

GROUP NUMBER

1 2 13 14 15 16 17 18

1 H 2 He

2 Li Be 3 B 4 C 5 N 6 O 7 F 8 Ne

3 Na Mg 9 Al 10 Si 11 P 12 S 13 Cl 14 Ar

4 K Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 33 As 34 Se 35 Br 36 Kr

5 Rb Sr 39 Y 40 Zr 41 Nb 42 Mo 43 Tc 44 Ru 45 Rh 46 Pd 47 Ag 48 Cd 49 In 50 Sn 51 Sb 52 Te 53 I 54 Xe

6 Cs Ba 57 La* 72 Hf 73 Ta 74 W 75 Re 76 Os 77 Ir 78 Pt 79 Au 80 Hg 81 Tl 82 Pb 83 Bi 84 Po 85 At 86 Rn

7 Fr Ra 89 Ac** 104 Rf 105 Db 106 Sg 107 Bh 108 Hs 109 Mt 110 Ds 111 Rg 112 Cn 113 Uut 114 Fl 115 Mc 116 Lv 117 Ts 118 Og

Transition Metals

GROUP NUMBER

3 4 5 6 7 8 9 10 11 12

*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

41. Answer: a

Explanation:

The correct answer is the USA.

★ Key Points

- The **first edition (2018)** of the **2+2** dialogue between **India-US** held in **New Delhi**.
- In the inaugural meeting, **Minister of External Affairs (MEA) Sushma Swaraj** and **Defence Minister Nirmala Sitharaman** hosted **US Secretary of State Michael R. Pompeo** and **US Secretary of Defence James Mattis**.

★ Additional Information

- The **third India-Australia Secretary-level 2+2 dialogue** was held on **9 December 2019** in **New Delhi**.
 - The Indian side was led by **Defense Secretary Ajay Kumar** and **Foreign Secretary Vijay Gokhale**, while its counterpart delegation was led by

Australia's Defense Secretary Greg Moriarty and Foreign Secretary Frances Adamson.

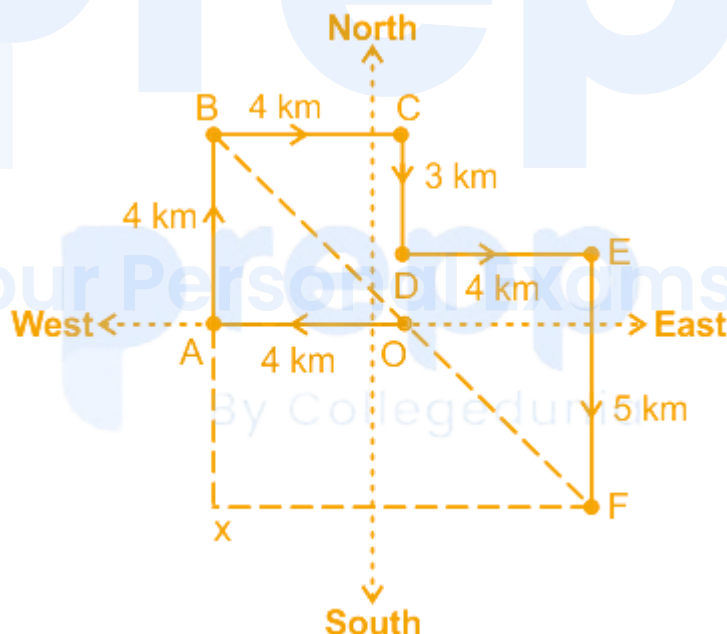
★ Hint

- The **2+2 dialogue** is the **second-highest level of engagement** between both countries after summit-level engagement between **the Prime Minister and the US President**.
- 2+2 dialogue is **aimed to enhance strategic** coordination between both countries and **maintaining peace and stability** in the **Indo-Pacific region**.

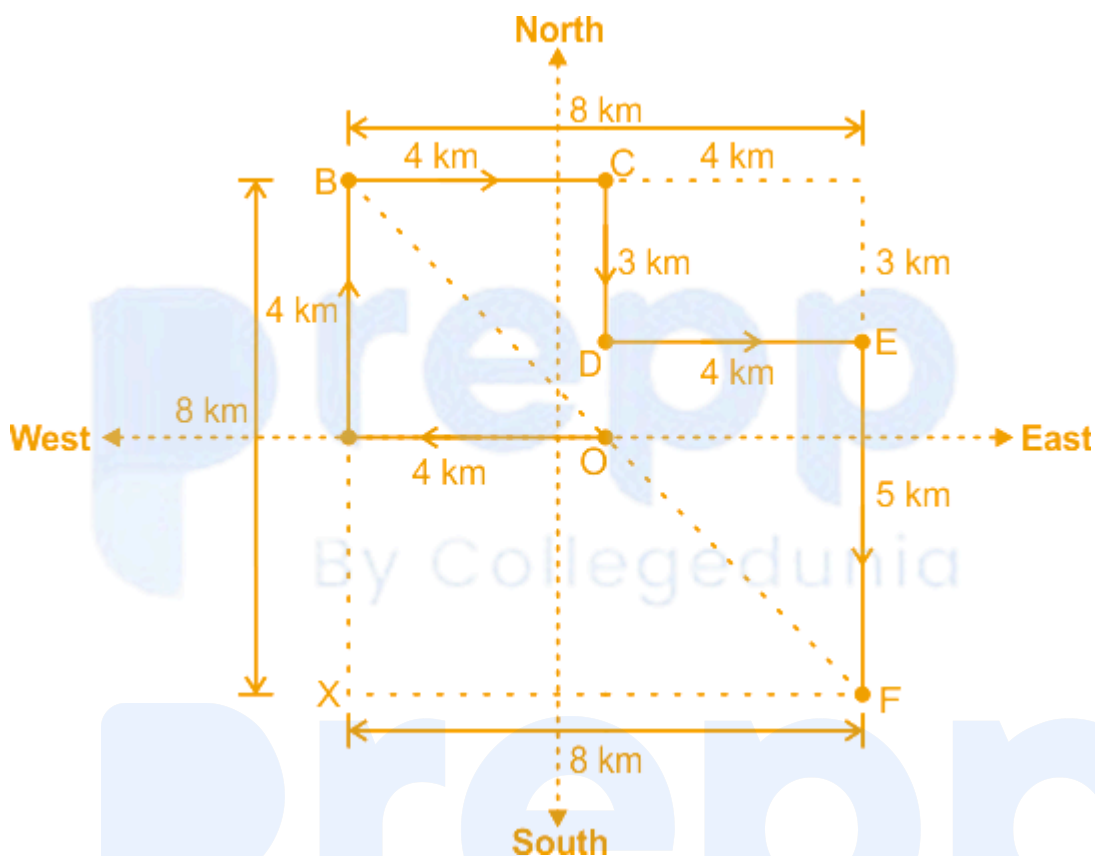
42. Answer: a

Explanation:

The shortest distance between point B and point F is –



After final arrangement:



∴ By Pythagoras theorem,

$$BF^2 = BX^2 + XF^2$$

$$\therefore BF^2 = 8^2 + 8^2$$

$$\therefore BF^2 = 64 + 64 = 128 = 8\sqrt{2}$$

∴ The shortest distance between B and F is $8\sqrt{2}$.

Hence, the correct answer is $8\sqrt{2}$.

43. Answer: b

Explanation:

The logic followed here is:

- Odometer used to measure the **Distance**.

Similarly,

- Ammeter used to measure the **current**.

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

44. Answer: c

Explanation:

Given,

Dhawan plans to buy a flat at Shyamla Society.

Shyamala Society has placed the following conditions for allotment of flats in its society:

Applicant :

- (I). State domicile certificate must be submitted.
- (II). Must have done a job of at least 5 years.
- (III). If needed, he will be ready to pay the entire amount in 5 years.
- (IV). Should not be the owner or co-owner (if spouse) of the residential facility in that city
- (V). Should not be below 35 years of age as on 31 December 2016.

Information about Dhawan,

Dhawan is an industrialist and from another state who established his factory in 2000 and has a state residence certificate. He is ready to pay the full amount in 4 years if necessary. He does not have a house in that city but his wife has a flat. His date of birth is 11 November 1970.

Here we see Dhawan's wife has a flat in that city.

Therefore, the Shyamala Society will not allot flat to Dhawan as his wife has a flat in the same city.

Hence, the correct answer is Do not allot flat.

45. Answer: c

Explanation:

The correct answer is 1206 AD and 1526 AD.

★ Key Points

- Delhi Sultanate ,five short-lived dynasties , based in Delhi, from 1206 to 1526 AD ,when it fell to the Mughal Empire .
- During this period of over three hundred years , five dynasties ruled in Delhi.
 1. The Slave dynasty (1206–90)
 2. Khilji dynasty (1290–1320)
 3. Tughlaq dynasty (1320–1413)
 4. Sayyid dynasty (1414–51)
 5. Lodhi Dynasty (1451–1526)

★ Additional Information

- Qutub-ud-din Aibak, a slave of Muhammad Ghori , who became the ruler after the death of his master, founded the Slave Dynasty .
 - He was a great builder who built the majestic 238 feet high stone tower known as Qutub Minar in Delhi .
 - The next important king of the Slave dynasty was Shams-ud-din Iltutmush , who himself was a slave of Qutub-ud-din Aibak .
 - Razia Begum , the capable daughter of Iltutmush , was the first and the only Muslim lady who ever adorned the throne of Delhi .
 - Balban consolidated the administrative set up of the empire and completed the work started by Iltutmush.
- Jalal-ud-din Khilji on the throne and this marked the beginning of the Khilji dynasty .

- **Ala-ud-din Khilji, a nephew of Jalal-ud-din Khilji** hatched a conspiracy and got Sultan Jalal-ud-din killed and proclaimed himself as the **Sultan in 1296**.
- **Ghyasuddin Tughlaq**, who was the Governor of Punjab during the reign of Ala-ud-din Khilji, ascended the throne in 1320 A.D. and **founded the Tughlaq dynasty**.
 - **Muhammad-Bin-Tughlaq** succeeded his father and **extended the kingdom beyond India, into Central Asia**.
 - He first shifted his **capital from Delhi to Devagiri in Deccan**.
 - He died in 1351 A.D. and **his cousin, Feroz Tughlaq** succeeded him.
- **Sayyid dynasty was founded by Khizar Khan**.
- **Bahlul Lodī** was the founder of the **Lodhi dynasty**.
 - **Ibrahim Khan Lodhi** was the **last ruler of the Lodi dynasty** when he was **defeated and killed at the Battle of Panipat by Babur's invading army**, giving way to the emergence of the Mughal Empire in India.

46. Answer: b

Explanation:

Concept:

- 1) We have to check the conclusions are 100% match with the statement. If the conclusion is 100% match with the given statement then the conclusion is true. If there is a 1% chance of not following the statement then the conclusion is considered to be false.
- 2) The possibility case can be considered to be "false" in "definite case".
- 3) In Possibility case, either "can" or "possible" word must be present.

Explanation

Given,

Statement: All tonics are poisonous substances. All poisonous substances are poison.

Conclusions:

1. All poison are tonics.
2. Some poison are tonics.

The least possible Venn diagram for the given statements is as follows,



Conclusions:

1. All poison are tonics → False (It is possible but not definite)
 2. Some poison are tonics → True (From Venn diagram we see some poison are tonics)
- Hence, the correct answer is **Only 2 follows**.

★ Additional Information

Statement	Conclusion		
	Definite (100% true)	Can't Say	Incorrect (100% false)
All A are B 	Some A are B Some B are A	Some B are not A All B are A	Some A are not B No A is B No B is A
Some A are B 	Some B are A	Some A are not B All B are A Some B are not A All A are B	No A is B No B is A
No A is B 	No B is A Some A are not B Some B are not A		Some A are B Some B are A All A are B All B are A
Some A are not B 		Some B are not A Some A are B Some B are A All B are A No A is B No B is A	All A are B

47. Answer: a

Explanation:

The correct answer is Gujarat.

★ Key Points

- The **Kakrapar Atomic Power Station (KAPS)** is located near **Surat** in the state of **Gujarat**.
- KAPS currently operates two PHWRs, the first of which (Unit-1) began commercial operations on 6 May 1993.

★ Important Points

- Nuclear power plants in India:

Power Station	State
Kaiga	Karnataka
Kudankulam	Tamil Nadu
Madras (Kalpakkam)	Tamil Nadu
Narora	Uttar Pradesh
Tarapur	Maharashtra

- **Kudankulam Nuclear Power Plant** is the **largest** atomic energy station in India.
 - Its capacity is **2,000MW**.
- **Tarapur Atomic Power Station** is the **first nuclear power plant** in India.
 - This plant is situated in Boisar, Maharastra in **Oct-1969**.
- **India's and Asia's first nuclear reactor** was the **Apsara research reactor** at **Mumbai**.

48. Answer: b

Explanation:

Given,

Hockey : Field :: Badminton : ?

Here we see the game Hockey is played on the rectangular ground which we called field.

Similarly, the game Badminton is played on **court**.

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

★ Additional Information

Sports	Field related to sports
Tennis, Volleyball, Basketball	Court
Road running, Race walking	Track
Wrestling	Arena
Football, Baseball, Cricket	Stadium

49. Answer: d

Explanation:

Let the ages of Mohan and Sohan be $5x$ and $4x$, respectively.

Now, the sum of their ages = 36

Hence, we get:

$$5x + 4x = 36$$

$$\Rightarrow x = 4$$

So, the present age of Sohan = $4 \times 4 = 16$ years

$\therefore$ The present age of Sohan is 16 years

50. Answer: b

Explanation:

The correct answer is Chhatrapati Shivaji Maharaj International Airport.

- Chhatrapati Shivaji Maharaj International airport sets a record with **980 flights** in 24 hours .

- On January 20, 2018, this airport created a new world record for **single-runway operations by handling 980 arrivals and take-offs in 24 hours**.

★ **Important Points**

- List of some airports in India:

Airport	Location
Amausi Airport (Chaudhary Charan Singh International Airport)	Lucknow, Uttar Pradesh
Indira Gandhi International Airport (largest airport)	New Delhi
Calicut International Airport (Kozhikode International Airport)	Kerala
Kushok Bakula Rimpochee Airport	Leh
Agatti Airport	Lakshadweep
Kempegowda International Airport	Bengaluru
Rajiv Gandhi International Airport	Hyderabad
Veer Savarkar International Airport	Port Blair, Andaman & Nicobar Islands

- India has a total of **34 operational International Airports**.

51. **Answer: d**

Explanation:

The correct answer is **Sitaram Yechury**.

- The Communist Party of India (Marxist) (CPIM) is a communist national political party in India.

- The CPI(M) was formed in **Calcutta** in 1964.
- **General Secretary:** Sitaram Yechury
- **Lok Sabha leader:** P.R. Natarajan
- **Rajya Sabha leader:** Elamaram Kareem
- the party was often referred to by different names such as '**Left Communist Party**' or '**Communist Party of India (Left)**'.
- **Kerala** is the **communist state** in India.

★ Important Points

- **Ram Madhav** is the National **General Secretary** of the **Bharatiya Janata Party**.
 - His written book is '**Uneasy Neighbours: India and China After 50 Years of the War**'.
- **Yogi Adityanath** is **Chief Minister** of **Uttar Pradesh**.
- **Viplav dev** is **Chief Minister** of **Tripura**.

52. Answer: d

Explanation:

Given:

Time taken to dig a pond by 63 people = 126 days

Formula used:

Total work = Number of persons × Number of days

Calculation:

Total work = 63×126

Time taken by 98 people to dig it = $(63 \times 126)/98$ days

⇒ 81 days

∴ 98 people can dig it in 81 days

53. Answer: b

Explanation:

The correct answer is Calculation not possible.

- Given,
 - Initial speed (u) = 5 ms^{-1}
 - Final speed (v) = 36 ms^{-1}
- Now, the equation of motion
 - $v = u + at$
 - v = final speed,
 - u = initial speed,
 - a = acceleration and
 - t = time
- $a = (v - u)/t$
- So in order to find acceleration, we need initial speed, final speed and time. But in question time is not given. **So acceleration cannot be calculated.**

54. Answer: c

Explanation:

The correct answer is Padma Bhushan.

★ Key Points

- Former Indian **cricket team captain MS Dhoni** has been given the country's **third-highest civilian honor** .
 - MS Dhoni received the prestigious **Padma Bhushan** from **President Ramnath Kovind** .
- Dhoni is the only captain in world cricket to win all **three** ICC trophies – **2007 World T20, 2011 World Cup, and 2013 Champions Trophy** .

- Dhoni is the co-owner of the **Chennai FC Indian Super League team** .
- He has the record of the **highest ODI score by a wicketkeeper**, which is **183** .
- Apart from CSK, the **Pune team** has bought Dhoni for IPL.

★ Important Points

- People who received the Padma Bhushan award in 2018:

Name	Field
Pankaj Advani	Sports- Billiards/Snooker
Philipose Mar Chrysostom	Others-Spiritualism
Ramachandran Nagaswamy	Others-Archaeology
Laxman Pai	Art-Painting
Arvind Parikh	Art-Music
Sharda Sinha	Art-Music

- Padma Vibhushan Winners 2018:

Name	Field
Illaiyaraja	Art-Music
Ghulam Mustafa Khan	Art-Music
Parameswaran	Literature and Education

55. Answer: c

Explanation:

Given,



The number of lines used to draw the above figure is,

Horizontal lines = 6

Slant lines = 12

Vertical lines = 13

∴ Total lines = 31

Hence the correct answer is 31.

56. Answer: c

Explanation:

Given,



In the mirror image, the top and bottom part of the figure remains unchanged and the left and right part of the figure interchanges.

∴



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

57. Answer: a

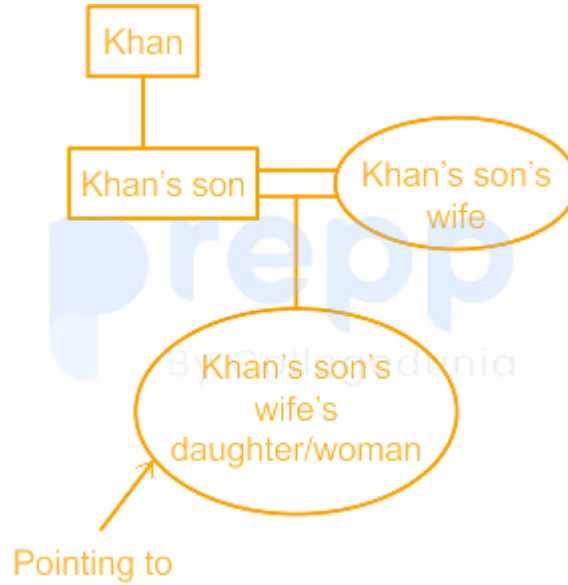
Explanation:

Given,

Pointing to a woman, Khan said, "She is the daughter of my brother's son's wife."

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

The family tree is as follows,



Here we see the woman is the **granddaughter** of Khan.

Hence, the correct answer is the Granddaughter.

58. Answer: b

Explanation:

The correct answer is Maharashtra.

- **Shiv Sena**, is a right-wing **Marathi regional political party** in India founded in 1966 by cartoonist **Bal Thackeray**.
- **Uddhav Thackeray** is the youngest child of **Bal Thackeray**.
- **Eknath Shinde** is the current **CM of Maharashtra**.

★ Additional Information

- **Saamana** is a **Marathi newspaper** launched in 1988 by **Bal Thackeray** who was also the editor of the newspaper.
- Its **student wing** is called **Bharatiya Vidyarthi Sena**.
- Its **women wing** is called **Shiv Sena Mahila Aghadi**.

59. Answer: b

Explanation:

Concept:

The minimum value of quadratic equation $f(x) = ax^2 + bx + c$ is

$$c - \frac{b^2}{4a}$$

Calculation:

The given quadratic function is:

$$f(x) = x^2 - 4bx + 9 \quad \text{-----(i)}$$

Compare it with $f(x) = Ax^2 + Bx + C$

$$A = 1, B = -4b, C = 9$$

Using the above concept, the minimum value

$$9 - \frac{(-4b)^2}{1} = -27$$

$$\Rightarrow 4b^2 = 36$$

$$\Rightarrow b^2 = 9$$

$$\Rightarrow b = 3, -3$$

$\therefore$ The value of b , for which the least value of quadratic function $f(x) = x^2 - 4bx + 9$ is -27 ; is 3 or -3 .

60. Answer: d

Explanation:

The correct answer is Lalji Singh.

- **Lalji Singh**, widely regarded as the **father of DNA fingerprinting in India**.
- He is a **former director of Hyderabad-based Centre for Cellular and Molecular Biology (CCMB)**.
- DNA fingerprinting was **invented in 1984** by Professor **Sir Alec Jeffreys** after he realized you could detect variations in **human DNA**, in the form of these **minisatellites**.

★ Important Points

- **Watson and Crick Propose the Double Helix structure of DNA with the two strands connected by hydrogen bonds.**
- DNA is a long molecule that contains our **unique genetic code**.
 - It holds the instructions for **making all the proteins in our bodies and the function of living things**.
- **In the cell nucleus, the DNA (deoxyribonucleic acid) molecule is packaged into thread-like structures called chromosomes.**
 - A chromosome (microscopic structure) is made up of DNA tightly coiled many times around proteins called histones that support its structure.
 - A chromosome has **two arms** – a **p arm** (short arm) and a **q arm** (long arm), joined in the location of the **centromere**.
- **The information in DNA (double helix structure) is stored as a code made up of four chemical bases: adenine (A), guanine (G), cytosine (C), and thymine (T).**
 - DNA has two base pairs, **A-T and G-C**, attached to a **sugar-phosphate backbone**.

★ Additional Information

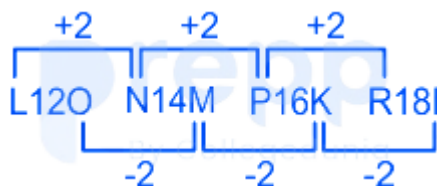
- **Gregor Mendel** is known as the **Father of modern genetics**.
 - **Mendel's laws of inheritance** include the **law of dominance**, the **law of segregation**, and the **law of independent assortment**.
- **Hargovind Khorana** got the **Nobel Prize in Physiology or Medicine in 1968** for his interpretation of the **genetic code** and its function in protein synthesis.

61. Answer: c

Explanation:

Given, L12O, N14M, P16K, _____.

The pattern followed here is,



Here we see the letters follow a particular pattern and the positional value of the first letter is written at the centre.

Hence, the correct answer is R18I.

62. Answer: d

Explanation:

The correct answer is $\epsilon = W/Q$.

- Electromotive force (EMF) is equal to the terminal potential difference when no current flows .
- EMF and terminal potential difference (V) are both measured in volts , however, they are not the same thing.
- EMF (ϵ) is the amount of energy (E) provided by the battery to each coulomb of charge (Q) passing through .
- The potential is kept high on the positive terminal and low on the negative terminal to maintain the potential difference between the two terminals .
 - The emf is equal to the work done (dW) on the charge per unit charge ($\epsilon = dW/dq$) when there is no current flowing .

Since the unit for work is the joule and the unit for a charge is the coulomb , the unit for emf is the volt ($1V = 1J/C$) .

63. Answer: a

Explanation:

The correct answer is Baking soda.

- Baking soda does not contain water of crystallization .
- The water of crystallization means having a fixed number of molecules present in one formula of a unit of salt.
 - e.g Blue vitriol ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$)
- The chemical formula of **baking soda** is NaHCO_3 .
 - Its formula does not show any **association with water molecules**.
- Baking soda is commercially manufactured on a large scale by the **ammonia-soda Solvay process**, named after **Ernest Solvay**, a **Belgian industrial chemist**.
- **Nahcolite** is **naturally occurring sodium bicarbonate**, and is extracted by "solution mining".

★ Important Points

- The other three options contain water of crystallization.
 - Blue vitriol ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$)
 - Washing soda ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$)
 - Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)
- Baking soda is **white amorphous powder** whereas **blue vitriol**, and **washing soda** are salts.

64. Answer: a

Explanation:

CONCEPT:

Here we need to look at the graph and find the value in y-axis corresponding to the year asked represented on the x-axis.

SOLUTION:

From the given bar graph we can say that,

Year on x-axis corresponds with value 20 on y-axis.

$\therefore$ No. of units sold in 2006 is 20 lakhs.

65. Answer: c

Explanation:

Given:

Base of a triangle = $(5/7) \times$ (Base of a parallelogram)

Area of the triangle = Area of the parallelogram

Formulae Used:

Area of a triangle = $(1/2) \times$ Base $\times$ Height

Area of a parallelogram = Base $\times$ Height

Calculation:

Let the base of the parallelogram be x

So, the base of the triangle = $(5/7)x$

Let the height of the parallelogram be P

Let the height of the triangle be T

Hence, we obtain the following:

The area of the triangle = $(1/2) \times [(5/7)x] \times T$ -----(i)

The area of the parallelogram = $x \times P$ -----(ii)

Now, both areas are equal. So, we get:

$$(1/2) \times [(5/7)x] \times T = x \times P$$

$$\Rightarrow T/P = 14/5$$

$\therefore$ The required ratio of the respective heights of the triangle and the parallelogram is 14 : 5

66. Answer: b

Explanation:

The pattern followed here is:

Parallelograms in Equilateral Triangles:

Formula:

$$\text{Number of Parallelograms} = \frac{n(n-1)(n+1)(n+2)}{8}$$

Given figure:



Used formula:

Here $n = 4$;

$$\text{Parallelograms} = [4(4-1)(4+1)(4+2)] / 8$$

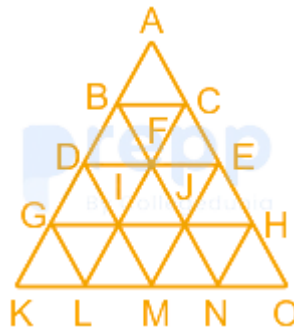
$$= (4 \times 3 \times 5 \times 6) / 8$$

$$= 360 / 8 = 45$$

Hence, the correct answer is "45".

★ Alternate Method

The number of parallelograms is,



The parallelograms consist of two triangles are,

ABFC, BDIF, CFJE, DGLI, FIMJ, EJNH, GKLI, ILMJ, JMNH, DGIF, FIJE, BDFC, GLMI, IMNJ, JNOH, DMNF, FJEC, BFEC = 18

The parallelograms consist of four triangles are,

GJMK, IHNL, DEJG, GJNL, IHOM, DEHI, DFLK, BCIG, FEML, FEON, BCHJ, DFNH, ACID, AEJB, BFLG, BJMD, CHNF, CEMI = 18

The parallelograms consist of six triangles are,

ACLG, BAHN, BCON, BCLK, GHNK, GHOL = 6

The parallelograms consist of eight triangles are,

DEMK, DEOM, AEMD = 3

∴ The total number of parallelogram = $18 + 18 + 6 + 3 = 45$

Hence, the correct answer is 45.

67. Answer: d

Explanation:

Given:

Average weight of the 4 packets received in January = 300g

Average weight of the 8 packets received in February = 400g

Formula Used:

Total weight = Number of packets $\times$ Average weight of each packet

Calculation:

Total weight of the 4 packets received in January = $4 \times 300 = 1200$ g

Similarly, the total weight of the 8 packets received in February = $8 \times 400 = 3200$ g

Hence, the total weight of all the packets received by the person in both months = $1200 + 3200 = 4400$ g

Also, the total number of packets received in the two months = $4 + 8 = 12$

Now, the required average weight = $4400/12 = 366.67$ g

$\therefore$ The average weight (in g) of all the packets received by the person in both months is 366.67

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68. Answer: b

Explanation:

The correct answer is 2005.

★ Important Points

- **2005** was a momentous year for the **right to information (RTI)** in India because it saw the **enactment of a national right to information law** .
- The Central Act was passed by the Indian Parliament on **12 May 2005** .
- The Right to Information Act, which gives **legal rights to people** to **seek information from the government and curb corruption** .

- The law promises accountability and transparency to climb up several notches, especially as it provides for hefty fines and disciplinary action against erring officials.

★ Additional Information

- On **October 12, 2005**, a person called **Shahid Raza Burney** submitted **India's first-ever Right To Information** application to a **police station in Pune** and thus we entered the RTI age.
- The **application fee for one single RTI is 10 rupees**.

69. Answer: b

Explanation:

The given number is:

$$2^{13} \times 3^5 \times 5^3 \times 7^6$$

For each term, the perfect cubes can be obtained as:

For $2^{13} = 2^0, 2^3, 2^6, 2^9, 2^{12}$; i.e. 5 terms

For $3^5 = 3^0, 3^3$; i.e. 2 terms

For $5^3 = 5^0, 5^3$; i.e. 2 terms

For $7^6 = 7^0, 7^3, 7^6$; i.e. 3 terms

So, we have the multiples of the number $2^{13} \times 3^5 \times 5^3 \times 7^6$ as perfect cubes = $5 \times 2 \times 2 \times 3 = 60$

∴ The number of multiples of the number $2^{13} \times 3^5 \times 5^3 \times 7^6$ are perfect cubes or complete cubes, are 60

70. Answer: a

Explanation:

The correct answer is It is a disease caused by the absence of genes responsible for the factors that cause blood clotting.

- Haemophilia is a **group of bleeding disorders**. Blood clotting factors are needed to stop bleeding.
- The most common types are:
 - **Hemophilia A (classic haemophilia)**—caused by too little or no factor VIII (most common)
 - **Hemophilia B (Christmas disease)**—happens in males, caused by too little or no factor IX
- Causes of this disease is a **faulty gene on a certain DNA strand**.
 - Females carry 2 copies of the strand. If one is faulty, the other one takes over. The faulty gene can pass to their children. If so, the female child will carry the gene. If it passes to the male, they will get the disease because they carry one copy of the strand.

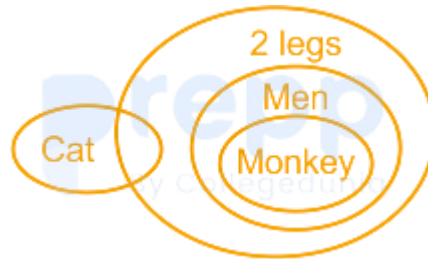
★ Additional Information

- Haemoglobin disorders (also known as **hemoglobinopathies**) are rare blood conditions that affect a person's haemoglobin which is the protein in the blood that carries oxygen.
- **Sickle Cell Disease** includes a group of related disorders that affect a person's **red blood cells**.
 - With sickle cell disease, a person's red blood cells can become **hard, sticky, and sickle-shaped**.

71. Answer: a

Explanation:

The least possible overlapping venn diagram is shown below:



Option 1) All monkeys have two legs $\rightarrow$ True (As seen from the figure all monkeys are men and all men have two legs, thus all monkeys have two legs is definitely correct)

Option 2) Some monkeys are not cats $\rightarrow$ False (We can draw a big circle of cat which will include all monkeys, then the statement Some monkeys are not cats becomes incorrect)

Option 3) Some men are cat $\rightarrow$ False (as seen from the figure men and cat have no connection so it is incorrect)

Option 4) All men have four legs $\rightarrow$ False (as there is no mention of 4 legs in the statement so we can't assume anything on own, thus it is also incorrect)

Therefore, the option "All monkeys have two legs" is definitely correct.

Hence, the correct answer is All monkeys have two legs.

NOTE:

There is a discrepancy in the original paper and the board itself considered it invalid. so we modify this question a little bit according to the standard of the previous question.

72. Answer: a

Explanation:

Given,

Statement:

"Please note that the company will only provide accommodation to outside candidates if selected."

Assumptions:

I. The company plans to select only external candidates

→ Not implicit as the company is not planning to select only external candidates or we don't know by the statements that the company is selecting internal or external candidates.

II. The second company plans to select only local candidates.

→ Not implicit as the company is not planning to select only local candidates or we don't have anything about the second company in the statement.

Therefore, neither assumption I nor II is implicit.

Hence the correct answer is, neither assumption I nor II is implicit.

73. Answer: a

Explanation:

The correct answer is Mass per unit volume.

- Density is an important physical property for **characterizing a material or chemical system**.
- Mathematically, density is calculated as a **substance's mass per the volume it occupies**.
- The formula for density is $d = M/V$, where **d is density**, **M is mass**, and **V is volume**.
 - Density is commonly expressed in units of **grams per cubic centimetre (g/cm^3)**.

★ Key Points

- **Water** achieves its **maximum density at 4°C (39.2°F)**.

- The natural **density of milk** is 1.200 times greater than normal water at 4°C, i.e. the **standard density of water** 1 gm/cc.

74. Answer: c

Explanation:

The correct answer is Singapore.

- **India and Singapore** signed the **Second Protocol amending** the Comprehensive Economic Cooperation Agreement (CECA) in **New Delhi**.
- The Protocol was signed by Deputy Chief Negotiators, Shri Rajneesh, Joint Secretary, Ministry of Commerce and Industry, Government of India, and Mr Francis Chong, Senior Director, Ministry of Trade and Industry, Government of Singapore.
- CECA will boost **bilateral trade** between India and Singapore.

★ Hint

- **Singapore** is the **second-largest** trading partner of India within **ASEAN**.
 - Singapore's trade with India constitutes about **21.8%** of the total trade with ASEAN.

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75. Answer: c

Explanation:

The correct answer is 25%.

Given Data:

- Mass of sugar = 50 grams
- Mass of water = 150 grams
- Mass of total solution = 200 grams

- The concentration of the solution in terms of mass by mass percent of the solution is as given below:
- $Mass = \frac{Mass\ of\ solute}{Mass\ of\ solution} * 100$
- $= \frac{50}{200} * 100$
- **25%**

76. Answer: a

Explanation:

The correct answer is Kamal Hassan.

- **Kamal Hassan** had won the **Henri Langlois Award** for his contribution to cinema in France as a **child artist in his debut movie Kalathoor Kannamma in 1959**.
- In **2016**, He was awarded the **Knight Of the Order of Arts and Letters** for his huge contribution to cinema.

★ Important Points

- Bollywood artists who were honoured by foreign countries for their contribution to cinema:

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Satyajit Ray	He was conferred France's highest civilian award the 'Legion of Honour' at a function at the Calcutta Library in 1989.
Amitabh Bachchan	- He was conferred France's highest civilian award the 'Legion of Honour'. - He was also decorated with the Medal of Honour of Morocco by Morocco's King Mohammed.
Anurag Kashyap	The Gangs Of Wasseypur director had been conferred with the Knight of the Order of Arts and Letters, a prestigious award from the French Government in 2015.
Aishwarya Rai Bachchan	In 2011, she was conferred with the Knight of the Order of Arts and Letters by the Ambassador of France in New Delhi, Jerome Bonnafont.
Shah Rukh Khan	- He was conferred with the Knight of Legion of Honor in 2014. - In 2012, he was conferred with Morocco's Medal of Honor at the Marrakech International Film Festival.
Sajid Nadiadwala	In 2016, producer Sajid Nadiadwala was decorated with the Knight of the Order of Arts and Letters by Mr Alexandre Ziegler, Ambassador of France to India.
Manish Arora	The first Indian designer to be conferred with the Legion of Honour in 2016.

Nandita Das	Critically acclaimed actor-director Nandita Das was conferred with the Knight of the Order of Arts and Letters by Jerome Bonnafont during her felicitation in Delhi.
Kalki Koechlin	She conferred "Knight of the Order of Arts and Letters" in 2018.
Sanjna Kapoor	She was awarded the French honour of Chevalier dans l'Ordre des Arts et des Lettres' (Knight of the Order of Arts and Letters) for her outstanding contribution to theatre in 2020.

77. Answer: b

Explanation:

The correct answer is Telangana.

- The **Singareni coal** reserves stretch across 350 Km of the Pranahita located in **Godavari Valley of Telangana** .
- Singareni Collieries Company Limited (SCCL) is currently operating **18 opencast and 27 underground mines in 4 districts of Telangana** .
- The present Company was incorporated on **23rd December 1920** .

★ Important Points

- Important mines in **Odisha** :
 - Iron ore in Joda, Keonjhar, Jajpur.
 - Manganese in Keonjhar, Rayagada, Sundergarh.
 - Bauxite in Balangir, Koraput, Kalahandi, Sambalpur.
 - Coal in Jharsuguda, Talcher.
- The principal mineral-bearing belts in **Maharashtra** are the **Vidarbha area in the east** and the **Konkan area in the west** .

- Important mineral occurrences are:
 - Bauxite in Kolhapur, Raigad, Ratnagiri, Satara, Sindhudurg, Thane districts.
 - China clay in Amravati, Bhandara, Chandrapur, Nagpur, Sindhudurg, Thane districts.
 - Chromite in Bhandara, Chandrapur, Nagpur, Sindhudurg districts.
 - Coal in Nagpur, Chandrapur, Yavatmal districts.
 - Dolomite in Chandrapur, Nagpur, Yavatmal districts.
 - **Gold in Bhandara, Nagpur districts .**
- Important mines in **Chhattisgarh** :
 - Iron ore in Bailadila, Raoghat, Hahaladdi/Kodapakha, Metabodeli, Dalli Rajhara.
 - Bauxite in Mainpat, Kandraja block, Jamirapat, Pendrapat.
 - Coal in Sohagpur, Jhilimili, Chirimiri, Bisrampur, Lakhampur, Panch Bahreni, Korba, Mand Raigarh.

78. Answer: b

Explanation:

For a number to be divisible by 6, 9, 12, 13 and 15; it should be a multiple of the LCM of all these numbers.

$\text{LCM}(6, 9, 12, 13 \text{ and } 15) = 2340$

The multiples of 2340 are:

2340, 4680, 7020, 9360, 11700, and so on.

Among these multiples, the highest four-digit number is 9360

$\therefore$ The largest 4 digit number divided by 6, 9, 12, 13, and 15 is 9360

79. Answer: a

Explanation:

The correct answer is Saba Karim.

- **Former India wicketkeeper Saba Karim** has been asked to resign from the post of **BCCI General Manager – Cricket Operations**.
- He played one Test and 34 ODIs for India, was appointed by the **Board of Control for Cricket in India in December 2017**.
- He was responsible for implementing operational plans, budgeting, monitoring the match playing conditions, and administration of the Domestic program.

★ Important Points

Sunil Gavaskar	• He is an Indian cricket commentator and former cricketer representing India. • He is also known as "Sunny", "Little Master". • Trinidad Calypso singer Lord Relator (Willard Harris) wrote a song in Gavaskar's honour, the "Gavaskar Calypso". • The Board of Control for Cricket in India (BCCI) named Sunil Gavaskar as the recipient of the Col CK Nayudu Lifetime Achievement Award for Cricket in India in 2012
Ravi Shastri	• Ravi Shastri is an Indian cricket coach, former commentator, cricketer, and current head coach of the Indian national cricket team.
MV Sridhar	• He is the former Indian first-class cricketer and GM of cricket operations in the Board of Control for Cricket in India (BCCI). • The former Hyderabad cricketer had resigned from his post in September 2017 after failing to report a conflict of interest.

★ Additional Information

- Sourav Ganguly is the president of BCCI 2020 .

80. Answer: a

Explanation:

Given:

Speed of the first cycle = 9 km/h = 2.5 m/s

Speed of the second cycle = 12 km/h = (10/3) m/s

Time taken by the train to cross the first cycle = 8 seconds

Time taken by the train to cross the second cycle = 8.4 seconds

Formula Used:

Distance = Speed × Time

When two bodies are travelling in the same direction,

Relative Speed = $a - b$;

where a is the speed of the faster body, and

b is the speed of the slower body.

Calculation:

Let the speed of the train crossing the cycles = v m/s

Using the formula for distance, we have:

$$(v - 2.5) \times 8 = [v - (10/3)] \times 8.4$$

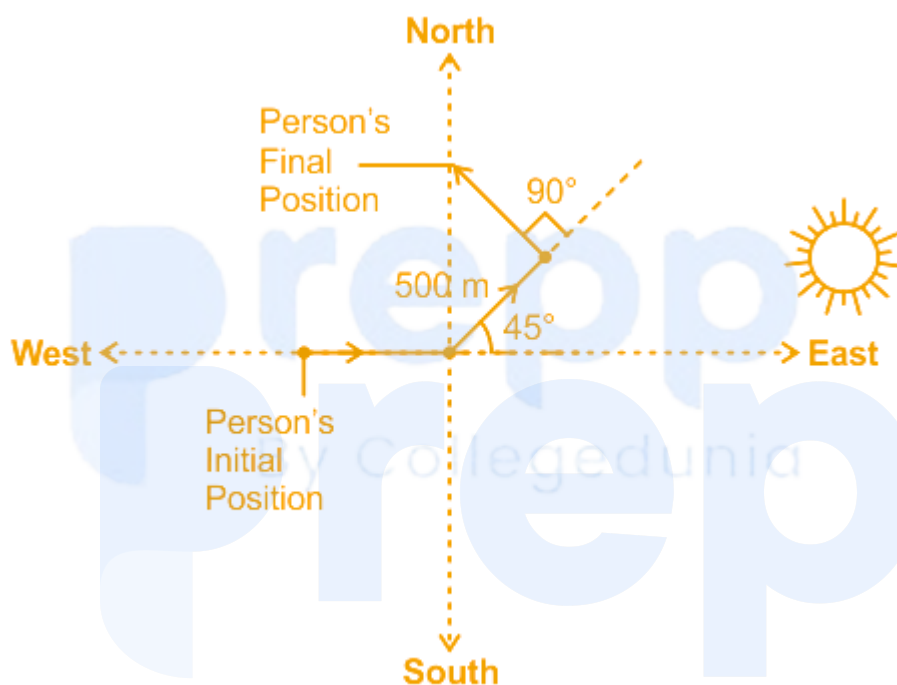
$$\Rightarrow v = 20 \text{ m/s} = 72 \text{ km/h}$$

∴ The speed of the train is 72 km/h

81. Answer: c

Explanation:

Given,



Here we see the person is facing **North-West** direction.

Hence, the correct answer is North-West.

82. Answer: c

Explanation:

Given,

Statement: There are many aspects to a person.

Argument:

1. Yes, everyone responds to a situation that is different from the other → Correct as everyone's response to a situation is different from the other.

2. No, we are responsible for what we create all around us. What we produce happiness or sorrow is up to us.

→ Incorrect as we are not always responsible for what we create all around us.

∴ Only argument 1 is correct.

Hence the correct answer is, Only argument 1 is correct.

83. Answer: b

Explanation:

The correct answer is Anushka Sharma.

- Indian cricket captain **Virat Kohli** married film actress **Anushka Sharma** in 2017.

★ Important Points

- Virat Kohli is an Indian cricketer and the current captain of the India national team.
- In the **2011 World Cup** which India won, Kohli became the first Indian batsman to **score a century** on his World Cup debut.
- In **2012**, Kohli was named the **ICC ODI Cricketer of the Year** at the **age of 23**, being the **youngest** to win the coveted award.
- He won the **International Cricketer of the Year** at the **CEAT Cricket Rating Awards, 2019**.
- He won the **Rajiv Gandhi Khel Ratna** award in 2018.

84. Answer: c

Explanation:

The correct answer is Displacement takes place there.

- On the body, work is done only when **displacement takes place by force applied to the body**.
- There is a **displacement** of the body caused by the applied force **along the direction** of the **applied force**.
- it is possible that a **force is acting on a body and still the work done is zero**.
 - When there is **no displacement**.
- **Work done by conservative forces** to move a particle in a **closed path is zero**.
- Work done formula will be given as $W = F * d$, where F = force, and d = displacement.

★ Hint

- According to the work-energy theorem, the **work done by the force** is equal to an **increase in the kinetic energy** of the body.

85. Answer: d

Explanation:

Concept used:

Square root can be find by prime factorization method

Calculation:

$$21904 = 2 \times 2 \times 2 \times 2 \times 37 \times 37$$

$$\Rightarrow (2 \times 2 \times 37)^2$$

$$\Rightarrow 148^2$$

$\therefore$ The square root of 21904 is 148

86. Answer: c

Explanation:

The correct answer is 66.

- The **2018 Commonwealth Games** held at **Gold Coast, Australia**.
- India ranked **3rd**, with **26 Golds, 20 Silvers, and 20 Bronze medals**.
- The flag bearer of this game:
 - **Opening: P. V. Sindhu**
 - **Closing: Mary Kom**

★ Important Points

- **Shooter Heena Sidhu** clinched the **gold medal in the women's 25m pistol event** at the 21st Commonwealth Games (CWG) in Australia.
- Indian **sprinter Mohammad Anas** qualified for the finals of the men's **400m event**.
- **Shooter Shreyasi Singh** clinches the **gold medal in the women's double trap event**.
- **Shooter Jitu Rai** won **gold in the men's 10m air pistol event**.
- India's teen shooter **Manu Bhaker** grabbed the **gold medal in the women's 10m air pistol**.
- **Punam Yadav** won India's fifth gold medal in the women's **69kg weightlifting event**.
- The first Paralympic medal with **Para powerlifter Sachin Chaudhary** bagging **bronze in the heavyweight category**.
- The **15-year-old Indian shooter, Anish Bhanwala**, has created history by becoming the **country's youngest ever gold medal winner in the Commonwealth Games**.
- Indian wrestler **Bajrang Punia** has won **gold in the men's freestyle 65 kg category**.
- **Neeraj Chopra** became the first Indian **javelin thrower to claim a gold medal at the Commonwealth Games**.

★ Additional Information

- The 1st and 2nd position holds **Australia and England** respectively.
 - The **2022 Commonwealth Games** will be held in **Birmingham, England**.
 - The **first Commonwealth Game in 1930** was hosted in **Hamilton, Canada**.
 - **Delhi** hosted Commonwealth Games in **2010**.
-

87. Answer: c

Explanation:

The correct answer is Caravan Talkies.

- UFO Movies India Limited is a listed company and engaged in the **business of digital cinema distribution and in-cinema advertising**.

★ Key Points

- **Caravan Talkies**, which is owned by UFO Movies through its subsidiary is taking both **Bollywood and regional films** to the hinterlands of the country where there is no proper cinema hall.
 - Caravan Talkies is a **movie-on-wheels concept**, wherein **sundown non-ticketed** shows (complimentary) are played at **villages for India's rural population** situated in media dark areas.
 - This platform provides an opportunity for brands to reach out and engage with rural audiences via consumer activations in a fun and receptive environment.
-

88. Answer: b

Explanation:

The correct answer is Volt.

- The **SI unit of potential difference is volts** and is represented by the letter **V**.

★ Key Points

- Electric potential is the **amount of energy per unit charge at a particular point** .
- The difference in the electric potential between the two points is called the electrical potential difference. **Electric potential difference can also be called the voltage** .
- Some other quantities and their SI units:

SI UNIT	Quantity
Watt	Power
Joule	Energy
Coulomb	Electric charge
Ampere	Current
Volt	Potential difference(Voltage)

89. Answer: b

Explanation:

CONCEPT :

A leap year repetition will be on a leap year.

A non-leap year repetition will be on a non-leap year.

A calendar year is repeated after every 7 odd days.

No. of odd days in non-leap year = Remainder of $(365 \div 7) = 1$ odd day

No. of odd days in leap year = Remainder of $(366 \div 7) = 2$ odd day

Calculate the year gap with a multiple of 7.

If the leap year repetition comes after 7 odd days is also a leap year then it will be the answer, otherwise count for the next multiple of 7. Same for the non-leap year also.

EXPLANATION :

Given, It is Sunday on 30 September 2018.

For the year to have the same calendar as 2018 we need the sum of the number of odd days. When this sum is divisible by 7 then that year will have the same calendar as 2018.

∴

Year	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Odd Days	1	2	1	1	1	2	1	1	1	2	1

∴ The sum of the odd days = 14 days = 0 odd days.

∴ The 30th September 2029 will be Sunday.

Hence the correct answer is 2029.

★ **Shortcut Trick**

Year	Repetition after years
Leap year	28
Leap year + 1	6
Leap year + 2	11
Leap year + 3	11

★ **Important Points**

- For century non-leap years like 1500, 1700, 1900, 2100 calendar repeats after 6 years.
- After adding 28 to a leap years if it comes a non leap year then add 40 to it.

ex: $1972(\text{LY}) + 28 = 2000(\text{LY})$ but $2072(\text{LY}) + 28 = 2100(\text{NLY})$,

Therefore add 40 to it. $2072(\text{LY}) + 40 = 2112(\text{LY})$

iii) If crossing a century year while adding 6 or 11 then check whether the century year is LY or NLY. If NLY then add 12 or 6 accordingly. otherwise, remain same.

Ex: 1897 is a leap + 1 years so we add 6 to it generally which is wrong because 1900 is a NLY crossing so we add 12 years hence answer is 1909.

Ex: 1898 is a leap + 2 years so we add 11 to it generally which is wrong because 1900 is a NLY crossing so we add 12 years hence answer is 1910.

The year after 1600 end with 99.

If crossing century leap year like 2000, 2400 etc. then add 11 to it. 1999, 2399 etc repeats after 11 years.

If crossing century Non leap year year like 1700, 1800, 1900 etc. then add 6 to it. 1699, 1799, 1899, 2199, 2299 etc repeats after 6 years.

90. Answer: b

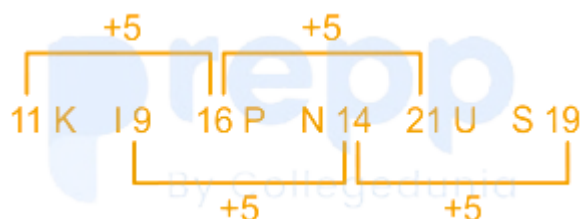
Explanation:

We know,

Given,

11KI9, 16PN14, _ _ _ _ _

The pattern followed here is letters are denoted by their place value.



Hence, the correct answer is 21US19.

91. Answer: a

Explanation:

The correct answer is **1 N m^{-2}**

★ **Important Points**

- The **pascal** is the **SI** derived unit of **pressure**.
- The unit, named after **Blaise Pascal**.
- The name pascal was adopted for the SI unit **newton per square meter** (N/m^2).
- The pascal can be expressed using SI derived units as:
 $1 \text{ pa} = 1 \text{ Nm}^{-2} = 1 \text{ Kgm}^{-1} \text{ s}^{-2} = 1 \text{ Jm}^{-3}$,
 - where N is the newton, m is the meter, kg is the kilogram, s is the second, and J is the joule.

★ **Key Points**

- **dyne cm^{-2}** is one of the **smallest pressure units** and is derived from the CGS unit for force where 1 dyne equals 1 gram accelerated by 1 centimetre per second squared.
- **1 Dyne per Square Centimetre equals 0.1 pascals**.
- The standard atmosphere (symbol: **atm**) is a unit of pressure defined as **101325 Pa (1.01325 bar)**.
- It is sometimes used as a reference or standard pressure. It is approximately equal to **Earth's atmospheric pressure at sea level**.
 - So **1 atmosphere = 101325 pa**
 - **1 pa = 1/101325 atm**

92. Answer: c

Explanation:

Given:

The ratio of the two numbers is 17 : 28.

Concept used:

Ratio concept used.

Calculation:

Let the smaller number be x

And the larger number be y

$$\text{So, } x/y = 17/28$$

$$\Rightarrow 28x = 17y \quad \text{-----(i)}$$

When 6 is added to the smaller number, the smaller number becomes = x + 6

So, the new ratio becomes:

$$(x + 6)/y = 13/20$$

$$\Rightarrow 20 \times (x + 6) = 13y$$

$$\Rightarrow 20x + 120 = 13y$$

$$\Rightarrow x = (13y - 120)/20 \quad \text{-----(ii)}$$

We substitute the value of x from equation(ii) into equation(i), to get:

$$28 \times [(13y - 120)/20] = 17y$$

$$\Rightarrow 28 \times (0.65y - 6) = 17y$$

$$\Rightarrow y = 140$$

$\therefore$ The value of the larger number is 140.

★ Alternate Method

$$(17x + 6) : 28x = 13 : 20$$

$$\Rightarrow (17x + 6)/28x = 13/20$$

$$\Rightarrow 20(17x + 6) = 13(28x)$$

$$\Rightarrow 340x + 120 = 364x$$

$$\Rightarrow 120 = 24x$$

$$\Rightarrow x = 120/24 = 5$$

$$\text{Larger number} = 28x = 28 \times 5 = 140$$

$\therefore$ The value of the larger number is 140.

93. Answer: c

Explanation:

The correct answer is Lead oxide + oxygen + nitrogen dioxide.

★ Important Points

- **Lead nitrate** is a white coloured inorganic compound.
- It is soluble in water.
- The chemical formula of lead nitrate is **Pb(NO₃)₂**.
- Lead nitrate is poisonous in nature.

★ Additional Information

- Decomposition is the chemical reaction where a complex substance breaks into simpler ones.
- Decomposition of Lead Nitrate occurs when it is strongly heated. This is called **thermal decomposition**.
- The Chemical reaction of decomposition of lead nitrate is:



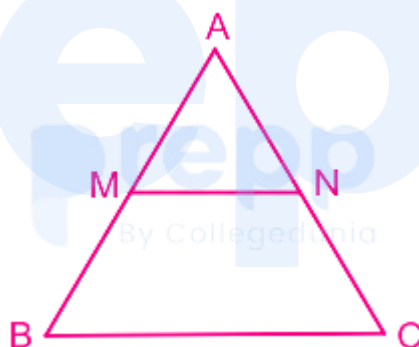
- So, the products of decomposition are:
 - Lead oxide → Yellow coloured
 - Nitrogen dioxide → Brown coloured gas
 - Oxygen → Colourless

94. Answer: b

Explanation:

Given:

The $\triangle ABC$ as given in the question can be drawn as follows:



Here, MN and BC are the base of the $\triangle AMN$ and the trapezium BMNC, respectively.

We have $MN : BC = 7 : 9$.

Concept Used:

Property of a trapezium is that its two sides are parallel and the other two are not parallel.

In similar triangles with sides of length x and y , respectively; the ratio of their areas = $(x/y)^2$

Calculation:

Assume $MN = 7x$, and $BC = 9x$

So, by the property of similar triangles, the ratio of areas of ΔAMN and $\Delta ABC = (7x/9x)^2 = 49 : 81$

Also, area (trapezium BMNC) = area (ΔABC) – area (ΔAMN)

Hence, we can obtain the ratio of the areas of ΔAMN and the trapezium BMNC as:

$$49/(81 - 49) = 49/32$$

$\therefore$ The required ratio of the area of triangle AMN and the area of trapezium BMNC is 49 : 32

95. Answer: b

Explanation:

Given,

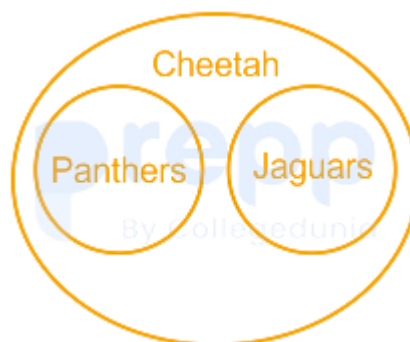
Statement: All jaguars are cheetahs, all panthers are cheetahs

Conclusion:

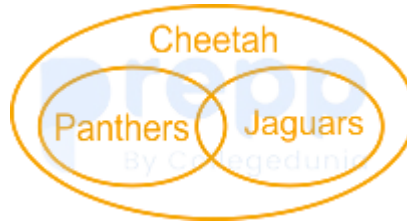
1. All Jaguars are Panthers.
2. Some Jaguars are Panthers.

The least possible Venn diagram for the given statements is as follows,

Case 1:



Case 2:



Conclusions:

1. All Jaguars are Panthers → False (As all Jaguars are Cheetah and all panthers are cheetah given so from both possible Venn diagrams, it can be possible but not definite)
2. Some Jaguars are Panthers → False (As all Jaguars are Cheetah and all panthers are cheetah given so from both possible Venn diagrams, it can be possible but not definite)

Hence, the correct answer is **Neither 1 nor 2 follows.**

96. Answer: d

Explanation:

The correct answer is Meristematic.

- Growth in plants occurs as the **stems and roots lengthen** . This is called primary growth.

★ Key Points

- Many plants, especially woody plants, also increase in thickness during their life span. This is called **secondary growth** .
- Plants continue to grow as long as they live. They grow through a **combination of cell growth and cell division (mitosis)** .
- **Cell division takes place in specialized tissue called meristematic tissue** .
 - The cells of the tissue are undifferentiated and continue to divide and differentiate.

- **Meristem** allows plant stems and roots to grow longer (primary growth) and wider (secondary growth).
- **Primary growth is caused by the growth of apical meristem and secondary growth is caused by lateral meristem .**

★ Additional Information

- **Parenchyma tissue** is involved in **photosynthesis, secretion, food storage** , and other activities of plant life.
- **Collenchyma tissue** provides **support, structure, mechanical strength, and flexibility** to the **petiole, leaf veins, and stem** of young plants, allowing for easy bending without breakage .
- **Xylem** is a **vascular tissue** . It transports water and dissolved minerals from the roots to the rest of the plant and also provides physical support .

97. Answer: a

Explanation:

Given:

The difference between 33% loss and 7% profit on selling an item is Rs 220.

Formulae Used:

If the Cost Price of an item is CP.

Then, when the article is sold for a loss, the Selling Price (SP) of the article is obtained as:

$$SP = [(100 - \%Loss)/100] \times CP \quad \text{----(i)}$$

Similarly, when the article is sold for a profit, the Selling Price (SP) of the article is obtained as:

$$SP = [(100 + \%Profit)/100] \times CP \quad \text{----(ii)}$$

Calculation:

Let the CP of the item be Rs.x

So, for a loss of 33%, the SP becomes:

$$SP = [(100 - 33)/100] \times x = 0.67x \quad \text{-----(iii)}$$

Similarly,

for a profit of 7%, the SP becomes:

$$SP = [(100 + 7)/100] \times x = 1.07x \quad \text{-----(iv)}$$

Now, the difference between these two selling prices = Rs.220

Hence, using equations (iii) and (iv), we get:

$$1.07x - 0.67x = 220$$

$$\Rightarrow 0.4x = 220$$

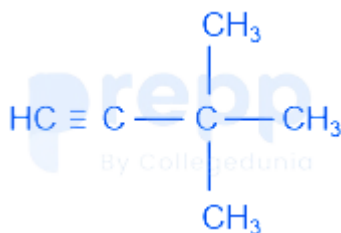
$$\Rightarrow x = 550$$

$\therefore$ The Cost Price of the item is Rs.550

98. Answer: b

Explanation:

The correct answer is



- **Unsaturated hydrocarbons** are hydrocarbons that have double or triple covalent bonds between adjacent carbon atoms.

★ Key Points

- The term "**unsaturated**" means **more hydrogen atoms may be added to the hydrocarbon to make it saturated** (i.e. consisting of all **single bonds**).
- The example of the **unsaturated compound** is **alkenes and alkynes** , as well as branched chains and aromatic compounds.

★ Additional Information

- **Alkane** – acyclic **saturated hydrocarbon** .
 - Alkane consists of hydrogen and carbon atoms arranged in a tree structure in which all the **carbon-carbon bonds are single** .
- **Alkene** – any hydrocarbon containing one or more double bonds.
 - Alkenes unsaturated **compounds**
- **Alkyne** – any hydrocarbon containing one or more triple bonds.
 - Alkenes unsaturated **compounds**

NOTE:

In the Official paper of RRB group D, the options given here are invalid, we have updated the options for better clarification for this question.

99. Answer: c

Explanation:

The correct answer is Marsilea.

- Plants belonging to the 'PTERIDOPHYTA' group are differentiated into true roots, stems, and leaves.

★ Key Points

- They are the first plants that have a vascular system.
- The **examples** of the **pteridophytes** plants are Fern, Horsetail, Psilotum, Azolla, Isoetes, **Marsilea**, Salvinia, Selaginella, Equisetum, Pteridium, etc.

★ Important Points

Funaria	• Funaria is a genus of approximately 210 species of moss. • Species in this genus are known as cord-mosses because of the rope-like way in which the stalk twists and curls with changes in humidity. • The specific epithet 'hygrometric' refers to the hygroscopic nature of the seta.
Chara	• Chara is freshwater, green alga found submerged in shallow water ponds, tanks, lakes, and slow running water. • They are called stoneworts because the plants can become encrusted in lime (calcium carbonate) after some time. • The "stem" is actually a central stalk consisting of a giant, multinucleated cells.
Marchantia	• Marchantia, a genus of liverworts (creeping ribbonlike plants) in the order Marchantiales, commonly found on moist clay or silty soils, especially on recently burned land throughout the Northern Hemisphere.

100. Answer: d

Explanation:

Given,

A means addition,

E means division,

I means subtraction,

O means multiplication and

the remaining letters are replaced with numbers according to their chronological position (used as mathematical notation If the letters formed to retain their number in the series)

88E11A214 = ?

$\therefore 88 \div 11 + 2 - 4$

$\therefore 8 + 2 - 4 = 10 - 4 = 6$

Hence the correct answer is 6.

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