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Your Personal Exams Guide

- NDA
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- SSC CGL
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- SBI PO
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- IBPS RRB
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- IES
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RRB Group D 2018 Previous Year Paper (22-Sep-2018) (Shift 3)

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.

CBT

1. Who is the recipient of the Prime Minister's Award for outstanding contribution to promotion and development of yoga in 2018? **(+1, -0.33)**

   a. Tirumalai Krishnamacharya

   b. K. Pattabhi Jois

   c. B. K. S. Iyengar

   d. Vishwas Mandlik

---

2. What is the maximum amount of work done in 10 s by a 20 kW engine? **(+1, -0.33)**

   a. 20 KJ

   b. 200 KJ

   c. 25 KJ

   d. 2 KJ

---

3. Arjun started a task and left it after working for 2 days. Then, Bharath was called and he completed the task in 9 days, If Arjun alone had worked for 3 days, Bharath alone would have finished the remaining work In 6 days. In how many days can Arjun alone complete the task? **(+1, -0.33)**

   a. 8 days

   b. 12 days

   c. 5 days

   d. 10 days

4. The mean of the 6 smallest numbers from a group is 15 while the mean of all the 14 members of the group taken together is 17. What is the mean of the 8 largest numbers? **(+1, -0.33)**

   a. 18.25

   b. 17.25

   c. 18.75

   d. 18.50

---

5. The time duration that would elapse between 2:38 p.m. of 11 May 2023 and 2:29 p.m. of 13 May 2024 is: **(+1, -0.33)**

   a. 368 days 9 minutes

   b. 367 days 9 minutes

   c. 366 days 23 hours 51 minutes

   d. 367 days 23 hours 51 minutes

---

6. Consider the given statement to be true if it seems to be at variance with the commonly known facts and decide which of the conclusions logically follow(s) from the statement. **(+1, -0.33)**

   Statement:

   The grass is always greener on the other side of the fence.

   Conclusions:

   I. Humans are never completely satisfied with where they are in life.

II. Humans see their own flaws more vividly and don't consider the possibility that they may have the greener side.

a. Only conclusion I follows.

b. Both conclusions I and II follows.

c. Only conclusion II follows.

d. Neither conclusion I nor II follows.

---

7. Who is the first Pakistani to score a double century in ODIs? **(+1, -0.33)**

a. Sarfraz Ahamed

b. Saeed Anwar

c. Fakhar Zaman

d. Imam- Ul - Haq

---

8. Which of the following former or current Chief Ministers of India had earlier served as Priest of a temple? **(+1, -0.33)**

a. Yogi Adityanath

b. Vijay Rupani

c. Mayawati

d. Manohar Parrikar

---

9. Pemba Island is famous for the cultivation of which of the following? **(+1, -0.33)**

a. coffee

b. Rice

c. Wheat

d. Cloves

---

10. The enzyme _____, present in the pancreatic juice, converts proteins to amino acids. **(+1, -0.33)**

a. Pepsin

b. Lipase

c. Trypsin

d. Amylase

---

11. Gandhiji launched the Non-Cooperation Movement in a small village called Champaran. In which current Indian state is champaran located? **(+1, -0.33)**

a. Maharashtra

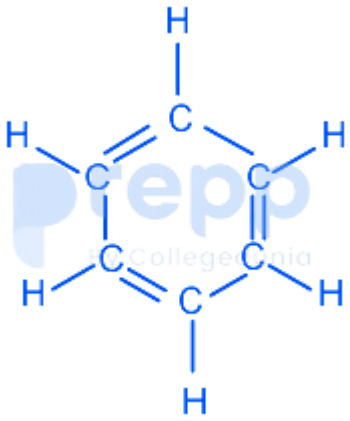
b. West Bengal

c. Gujarat

d. Bihar

---

12. What is the name of the compound shown in the below structure? **(+1, -0.33)**



a. Cyclohexane

b. Benzene

c. Cycloheptane

d. Naphthalene

---

13. What will be the acute angle between the hour hand and the minute hand at 6:25 p.m.? **(+1, -0.33)**

a. 30°

b. 40.5°

c. 42.5°

d. 35.5°

---

14. The first three terms of a proportion are 3, 5, and 21, respectively. Find its fourth term. **(+1, -0.33)**

a. 25

b. 30

c. 35

d. 20

---

15. Linen is related to cloth in the same way as Gold is related to: **(+1, -0.33)**

a. Yellow

b. Metal

c. Jeweller

d. Hard

---

16. The angle of depression of the foot of a building from the top of a tower 32√3 m high is 60°. How far away from the building is the tower? **(+1, -0.33)**

a. 32 m

b. 16 m

c. 16√3 m

d. 32√3 m

---

17. In ΔABC, D and E are points on AB and AC respectively such that DE is parallel to BC. If AD = 2 cm, BD = 3 cm, then $\frac{ar(\Delta ADE)}{ar(\Delta ABC)} is$: **(+1, -0.33)**

a. 4/9

b. 16/81

c. 4/25

d. 2/5

---

18. What will be the unit digit in 3^{31}? **(+1, -0.33)**

a. 7

b. 1

c. 9

d. 3

---

19. What is the least number added to 4042 to make it a perfect square? **(+1, -0.33)**

a. 64

b. 41

c. 58

d. 54

---

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

Statement:

All brooms are plastic.

All plastics are handles.

Conclusions:

1. All brooms are handles.

2. No plastic is a broom.

a. All conclusions follow.

b. Only conclusion 2 follows.

c. Only conclusion 1 follows.

d. Neither 1 nor 2 follows.

---

21. The _____ consists of relatively unspecialised cell with thin cell well. **(+1, -0.33)**

a. phloem

b. sclerenchyma

c. parenchyma

d. collenchyma

---

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

Statement:

The headmistress announced, "From now on, every Wednesday, a student from Class XI should come forward to recite poetry in the Assemble".

Assumptions;

I. The headmistress want children to develop interest in English.

II. The headmistress wants children to get rid of stage fear.

a. Only II is implicit

b. Both I and II are implicit.

c. Only I is implicit.

d. Neither I nor II is implicit

---

23. As per RBI Annual Report 2016-17, what is the estimated value of demonetised banknotes received? **(+1, -0.33)**

a. Rs. 19.48 lakh crore

b. Rs. 12.25 lakh crore

c. Rs. 13.35 lakh crore

d. Rs. 15.28 lakh crore

---

24. Who won the BCCI Lifetime achievement award for Women at the BCCI Annual Awards held in Bengaluru in March 2017? **(+1, -0.33)**

a. Shubhangi Kulkarni

b. Diana Edulji

c. Shanta Rangaswamy

d. Purnima Rau

---

25. Choose the one that does NOT belong to the group. **(+1, -0.33)**

a. Cantaloupe

b. Lily

c. Lotus

d. Jasmine

---

26. _____ is not a sexually transmitted disease. **(+1, -0.33)**

a. Candidiasis

b. Syphilis

c. Gonorrhea

d. Warts

---

27. If no force is applied to a moving object, then it will stop due to _____. **(+1, -0.33)**

a. Tension

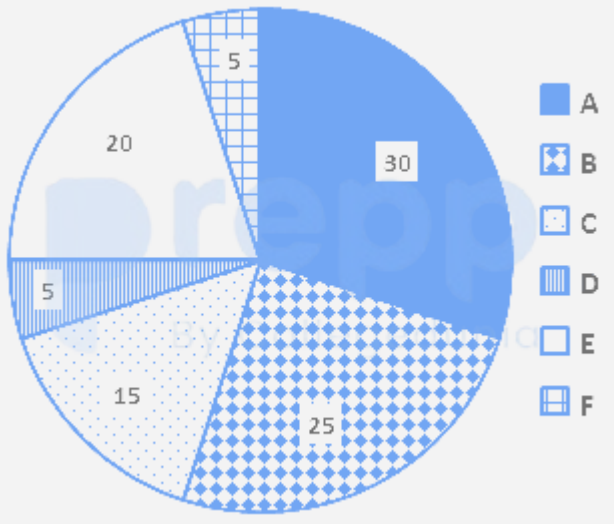
b. Momentum

c. Impulse

d. Friction

---

28. The given pie chart shows information about Non-Performing Assest (NPA) processed by the various banks of India till December 2017. **(+1, -0.33)**



If the total NPAs under all the banks are worth Rs. 300 lakh crores, then NPAs worth how much (in rs. Lakh crores) does Bank B contain till December 2017?

a. 50

b. 75

c. 25

d. 100

---

29. Find the smallest four-digit number that is divisible by 47. **(+1, -0.33)**

a. 1200

b. 1025

c. 1360

d. 1034

---

30. When washing soda reacts with hydrochloric acid _____ gas is evolved. **(+1, -0.33)**

a. Oxygen

b. Carbon monoxide

c. Carbon dioxide

d. Hydrogen

---

31. Find the next term in the following series. **(+1, -0.33)**

4A, 7B, 12D, 19G,?

a. 28K

b. 28P

c. 26U

d. 27G

---

32. A square field of area 31684 sq. meters is to be enclosed with wire placed at heights 1, 2, 3, 4 meters above the ground. What length of the wire will be required, if the length required for each wire is 5% greater than the perimeter of the field? **(+1, -0.33)**

a. 2099 m

b. 2309 m

c. 2990.4 m

d. 2090 m

33. If the speed of a cycle become two times, then the kinetic energy becomes _____. **(+1, -0.33)**

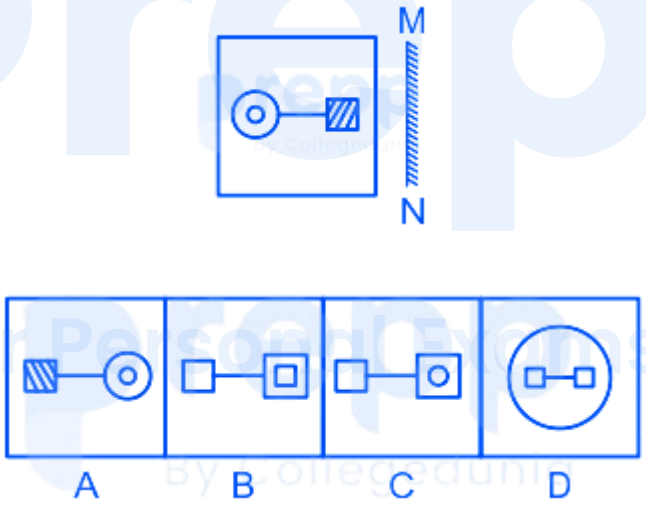
a. 2 times

b. 4 times

c. 8 times

d. 16 times

34. Choose the mirror image for the following figure when the mirror is kept at the MN line. **(+1, -0.33)**



a. C

b. A

c. B

d. D

35. Avogadro number is represented by _____. **(+1, -0.33)**

a. A_V

b. AN

c. N^0

d. N_A

---

36. _____ is not an actinoid. **(+1, -0.33)**

a. Terbium

b. Fermium

c. Nobelium

d. Thorium

---

37. 'Kalamakari', a Painting form recently seen in the news belongs to which Indian state? **(+1, -0.33)**

a. Andhra Pradesh

b. Tamil Nadu

c. Maharashtra

d. Rajasthan

---

38. If $x = \frac{\sqrt{3}+1}{2}$; then find the value of $4x^3 + 2x^2 - 8x + 7$. **(+1, -0.33)**

a. 10

b. 4

c. 8

d. 6

---

39. An element has an atomic number of 20 with which of the following elements will it show similar chemical properties. **(+1, -0.33)**

a. Be(4)

b. Fe(26)

c. Sc(21)

d. B(5)

---

40. Name the company that has adopted the maintenance of Charminar in Hyderabad as part of the Swatch Bhart Mission. **(+1, -0.33)**

a. Infosys

b. NTPC

c. ONGC

d. L&T

---

41. _____ is the only non-metal present in Group 1 of the Modern Periodic Table. **(+1, -0.33)**

a. Cobalt

b. Rubidium

c. Potassium

d. Hydrogen

---

42. A body of mass 30 kg moves with an initial speed of 20 m/s. If a retarding force of 60 N is applied, how long will the body body take to stop? **(+1, -0.33)**

a. -10 s

b. 10 s

c. 9 s

d. 0.10 s

---

43. What is the next term in the following series? **(+1, -0.33)**

3, 2, 13, 12, 23, 22, _____.

a. 33

b. 32

c. 21

d. 29

---

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

a. A

b. D

c. C

d. B

---

45. Echoes are heard due to the phenomenon of _____. **(+1, -0.33)**

a. Reflection of sound waves

b. Resonance

c. Interference of sound waves

d. Refraction of sound waves

---

46. A _____ is a unisexual flower. **(+1, -0.33)**

a. Gulmohar

b. Hibiscus

c. Mustard

d. Papaya

---

47. Which of the following correctly represents the relationship between: **(+1, -0.33)**

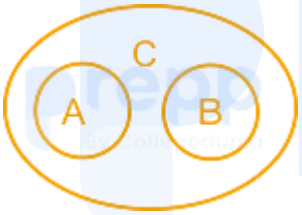
A) Vegetation

B) Jupiter

C) Earth

a. 

b. 

c. 

d. 

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48. Who has been awarded "Bharat Gaurav Award" 2017 in Science and Technology category? **(+1, -0.33)**

a. Arun K. Tripathi

b. Anil K. Tripathi

c. Arun K. Tiwari

d. Anil K. Tiwari

---

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

Statement:

Some pins are sharp.

All Sharp are metals.

Conclusions:

1. All metals are pins.

2. Some metals are sharp.

a. No conclusion follow

b. Only conclusion 2 follows.

c. Only conclusion 1 follows.

d. All the conclusions follow.

---

50. A molecule of Oxygen has _____. **(+1, -0.33)**

a. a double covalent bond

b. an electrovalent bond

c. a triple covalent bond

d. a single covalent bond

---

51. If the sides of a square are increased by 30%, find the % increase in its area. **(+1, -0.33)**

a. 79%

b. 68%

c. 69%

d. 65%

---

52. When phenolphthalein is added to vinegar, the solution become _____. **(+1, -0.33)**

a. blue

b. red

c. pink

d. colourless

---

53. If an object moves with a velocity of 60 m/s, how long will it take to travel 480 m. **(+1, -0.33)**

a. 7 s

b. 8 s

c. 0.8 s

d. 80 s

---

54. Two football teams, Team A and Team B, Played in a tournament and scored the following number of goals over 4 matches. What is their average score? **(+1, -0.33)**

Games	Goals by Team A	Goals by Team B
Game 1	2	3
Game 2	1	2
Game 3	1	2
Game 4	4	5

a. Team A : 2, Team B : 4

b. Team A : 2, Team B : 3

c. Team A : 3, Team B : 2

d. Team A : 1, Team B : 3

---

55. Who among the following is the author of the book 'Indira Gandhi – A Life in Nature'? **(+1, -0.33)**

a. Jairam Ramesh

b. Natwar Singh

c. Sonia Gandhi

d. Priyanka Vadra

---

56. Read the given question and decide which of the following statements is/are sufficient to answer the question. **(+1, -0.33)**

What is the number of students in the class?

Statements:

1) The class contains 10^{th} class students.

2) The class contains 6 girls and 8 boys.

a. Only 2 is sufficient.

b. Neither 1 nor 2 is sufficient.

c. Only 1 is sufficient.

d. Either 1 or 2 is sufficient.

---

57. A 156.5 m long train, traveling at 57 km/hr, crosses a platform in 39 seconds. What is the length of the platform? **(+1, -0.33)**

a. 613.5 m

b. 476 m

c. 586 m

d. 461 m

---

58. Find the odd one out. **(+1, -0.33)**

a. D

b. C

c. B

d. A

---

59. Which of the option figures bears the closest resemblance to the question figure? **(+1, -0.33)**

a. C

b. A

c. D

d. B

---

60. John is facing in the west direction during the morning yoga. He turns 90° clockwise and then 270° anticlockwise. In which direction is he facing now? (+1, -0.33)

a. East

b. North

c. South

d. west

---

61. Name the director of the blockbuster movie 'Bahubali'. (+1, -0.33)

a. Madhur Bhandarkar

b. S. S. Rajamouli

c. Prabhu Deva

d. Karan Johar

---

62. The rate of change of momentum of a body is directly proportional to the _____. (+1, -0.33)

a. Applied potential energy

b. Applied force

c. Applied displacement

d. applied pressure

---

63. Select the one that does not belong to the below group. **(+1, -0.33)**

A. aluminium

B. Iron

C. Bakelite

D. Brass

a. D

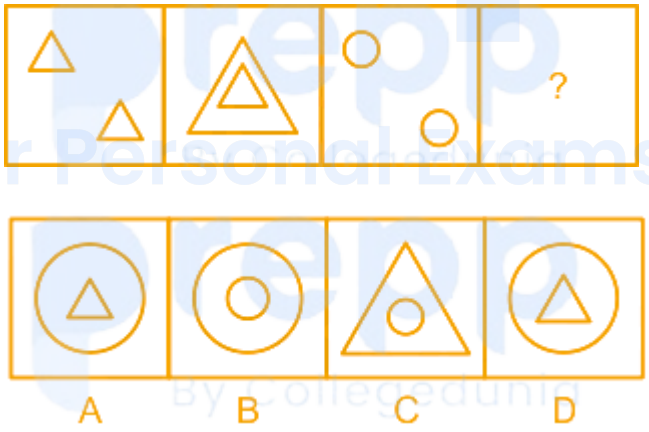
b. A

c. B

d. C

---

64. Which answer figure will come next in the given problem figure series? **(+1, -0.33)**



a. D

b. B

c. A

d. C

65. The element of the Lanthanide series having the atomic number 58 is _____. (+1, -0.33)

a. Cerium

b. Lanthanum

c. Thorium

d. Strontium

66. Which of the following factors does NOT affect the resistance of a conductor? (+1, -0.33)

a. Pressure

b. Material

c. Area of cross section

d. Length

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

Statement:

All flowers are petals.

All petals are soft.

Conclusions:

1. All flowers are soft.

2. Some soft are petal.

a. Only conclusion 2 follows

b. Neither conclusion follows.

c. Only conclusion 1 follows

d. Both conclusions follow.

---

68. Satheesh reads a novel in 6 days. On each day, he reads it for $1\frac{3}{4}$ hours. How many hours does he take to complete the novel? **(+1, -0.33)**

a. $7\frac{1}{2}$ hours

b. $10\frac{1}{2}$ hours

c. $11\frac{1}{2}$ hours

d. $9\frac{1}{2}$ hours

---

69. Which scheme has been launched by the union government for promoting solar farming? **(+1, -0.33)**

a. Krishin urja Suraksha evam Utthaan Mahaabhiyan

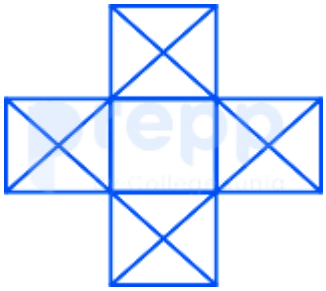
b. Kisan Urja Suraksha evam Utthaan Mahaabhiyan

c. Kisan Urja Suraksha evam Unnati Mahaabhiyan

d. Kusum Urja Suraksha evam Utthaan Mahaabhiyan

---

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



a. 32

b. 40

c. 44

d. 42

---

71. Priyamvada's present age is five years more than twice the age of his cousin Ritika. Sixteen years from now Priyamvada's age will be 150% of that of Ritika's. What is Priyamvada's present age (in years)? **(+1, -0.33)**

a. 23

b. 33

c. 17

d. 26

---

72. The interest on Rs. 1,250 for 15 years at the rate of 1.6% simple interest per annum will be: **(+1, -0.33)**

a. Rs. 350

b. Rs. 375

c. Rs. 360

d. Rs. 300

---

73. Find the next letter-pair in the following series. **(+1, -0.33)**

BT, EQ, HN, ?

a. GC

b. KZ

c. KG

d. KK

---

74. With reference to retail payments and settlement systems, what is the full form of NPCI? **(+1, -0.33)**

a. National Payment Consortium of India

b. National Payments corporation of India

c. National Piracy Council of India

d. National Protection Council India

---

75. Two horses cover the same distance at the rate of 10 km/hr and 15 km/hr, respectively. The distance traveled when one takes 12 minutes longer than the other is: **(+1, -0.33)**

a. 2 km

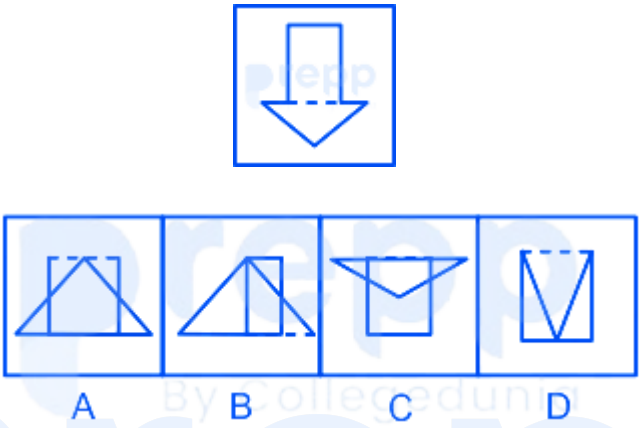
b. 4 km

c. 6 km

d. 8 km

---

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



a. C

b. D

c. B

d. A

---

77. In animal cells, _____ epithelium forms the inner lining of the kidney to provide mechanical support. **(+1, -0.33)**

a. Glandular

b. Cuboidal

c. Columnar

d. Squamous

---

78. Where is the Kandaleru Dam located? **(+1, -0.33)**

a. Kerala

b. Tamil Nadu

c. Karnataka

d. Andhra Pradesh

---

79. If, in a certain code language, LET is coded as12520, then how will WIN be coded in the same language? **(+1, -0.33)**

a. 23915

b. 21914

c. 23914

d. 24915

---

80. Tejal has a 40% stake and Ashank has a 60% stake in a partnership firm. On average, if Tejal makes a Rs. 10,00,000 profit a year, how much does Ashank make? **(+1, -0.33)**

a. Rs. 24 lakh

b. Rs. 15 lakh

c. Rs. 25 lakh

d. Rs. 30 lakh

---

81. The initial ratio of sugar and flour in the dough was 4 : 7 With 22 kg of the dough Justine added more flour to make the sugar to flour ratio 2 : 5. How much flour did Justine later added? **(+1, -0.33)**

a. 4 kg

b. 6 kg

c. 8 kg

d. 2 kg

---

82. Choose the most suitable Venn diagram for the following words. Jk **(+1, -0.33)**

Metal, Platinum, Oxygen

a. 

b. 

c. 

d. 

---

83. How much less is 28.8 km than 42.3 km. **(+1, -0.33)**

a. 13.5 km

b. 1.354 km

c. 1.25 km

d. 12.5 km

---

84. Which of the following numbers is irrational? **(+1, -0.33)**

a. $\sqrt{16}$

b. $\sqrt[6]{1}$

c. $\sqrt[4]{4}$

d. $\sqrt[3]{8}$

---

85. The loudness of the Sound produced by a radio increases by _____. **(+1, -0.33)**

a. increasing the frequency

b. increasing the amplitude

c. increasing the wavelength

d. increasing the pitch

---

86. Given is a statement followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which **(+1, -0.33)**

of the assumptions and decide which of the assumptions is/are implicit in the statement.

Statement:

The safety, quality and nutritional value of the food we eat is of fundamental importance to our health and well-being.

Assumptions:

I. Food safety encompasses not only the prevention of gastro-intestinal illnesses caused by bacteria and viruses, but also the avoidance of harm form chemical contamination and the ingestion of unwanted physical contaminants.

II. Monitoring and enforcement of food safety requirements should be carried out by a rangeof professionally qualified officers.

a. Neither assumption I nor II is implicit.

b. Both assumptions I and II are implicit.

c. Only assumption II is implicit.

d. Only assumption I is implicit.

---

87. $92 - [\ 71 + \{4 - (5 - (4 - 2))\}] = ?$ **(+1, -0.33)**

a. 12

b. 21

c. 15

d. 20

---

88. As of 2018, who is the CEO of NITI Aayog? **(+1, -0.33)**

a. Amitabh Kant

b. Narendra Modi

c. Arvind Panagariya

d. Arvind Subramanian

---

89. Find the energy possessed by a stationary object at a height of 6 m and with a mass of 50 kg. ($g = 10m/s^2$) **(+1, -0.33)**

a. 3000 J

b. $3 \times 10^4 J$

c. 300 J

d. 30 J

---

90. In December 2017, with which country did India sign a pact for socio-economic development of Rakhine State? **(+1, -0.33)**

a. Japan

b. China

c. Maldives

d. Myanmar

---

91. Srinivas is four times as old as his daughter. Five years ago, Srinivas was nine times as old as his daughter was at that time. His daughters present age is: **(+1, -0.33)**

a. 10 years

b. 8 years

c. 6 years

d. 5 years

---

92. _____ have similar chemical properties but different atomic masses. **(+1, -0.33)**

a. Isomers

b. Isotopes

c. Actinides

d. Isobars

---

93. In which year was the regulation passed to ban the practice of Sati? **(+1, -0.33)**

a. 1840

b. 1852

c. 1837

d. 1829

---

94. Name the country which won the 2017 Women's Hockey asia Cup title? **(+1, -0.33)**

a. Nepal

b. India

c. Bangladesh

d. Pakistan

---

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

Statement:

Students should be encouraged to participate in debates.

Assumptions:

I. They will learn convincing skills.

II. Their communication skills will be enhanced.

a. Only II is implicit

b. Only I is implicit

c. Both I and II are implicit

d. Neither I nor II is implicit

---

96. Who among the following has been awarded Crystal award on 22nd January 2018 at WEF, World Economic forum Annual Summit held at Davos? **(+1, -0.33)**

a. Sundar Pichai

b. Raghuram Rajan

c. Shah Rukh Khan

d. Narendra Modi

---

97. Based on the arithmetic reasoning, find the number that is different from other options in the given list of numbers. **(+1, -0.33)**

a. 125

b. 100

c. 343

d. 216

---

98. Which of the following statements regarding a rectangle is correct? **(+1, -0.33)**

a. Its diagonals are equal and divide each other equally at the right angle.

b. Its diagonals are perpendicular to each other

c. Its diagonals are equal and divide each other equally.

d. It diagonals divide each other equally at the right angle.

---

99. Find the odd one out. **(+1, -0.33)**

a. D

b. B

c. C

d. A

---

100. The mean of 100 observations is 50. If one observation which was 60 is replaced by 160, the resulting mean will be: **(+1, -0.33)**

a. 50.5

b. 51

c. 52

d. 51.5

Answers

1. **Answer: d**

Explanation:

- Vishwas Mandlik was the recipient of the Prime Minister's Award for outstanding contribution to promotion and development of yoga in 2018.
- He was the founder of the "Yoga Vidya Dham".
- He has written many books and presented research papers in different International Yoga Conferences.
- 2019 Prime Minister's Award for outstanding contribution for promotion and development of Yoga-Antonietta Rozzi of Italy, Japan Yoga Niketan, Swami Rajarshi Muni of Life Mission, Gujarat, and Bihar School of Yoga, Munger.
- Tirumalai Krishnamacharya was also an Indian yoga teacher in the 20th century.
- K. Pattabhi Jois developed and popularized the vinyāsa style of yoga known as Ashtanga Yoga.
- B. K. S. Iyengar was an eminent yoga teacher. He regularly taught and popularized Hatha Yoga.

---

2. **Answer: b**

Explanation:

CONCEPT:

- Work: When a force is applied on a body and there is a displacement of the body in the direction of force then the work is said to be done by the force.

Work (W) = Force (F) × Displacement (S)

- The SI unit of work is Joule. 1 Joule (J) = 1 Nm
- Power: The rate of work done is power.

Power (P) = work (W) / time (t) (P = W / t = J / s)

CALCULATION:

Given that:

Time (t) = 10 seconds and Power (P) = 20KW = 20,000 Watts.

Work done (W) = Power (P) × Time (t) = 20,000 × 10 = 2,00,000 J = 200 KJ

- Hence, the **amount of work done is 200 KJ**. So option 2 is correct.

---

3. Answer: c

Explanation:

Let efficiency of Arjun and Bharath be x and y respectively,

According to the question

Total work = 2x + 9y ----(i)

Also, Total work = 3x + 6y ----(ii)

From equation (i) and equation (ii)

2x + 9y = 3x + 6y

⇒ 3x − 2x = 9y − 6y

⇒ x = 3y

⇒ x : y = 3 : 1

Total work = 2 × 3 + 9 × 1 = 15 units

∴ Arjun alone can complete the whole work in = 15/3 = 5 days.

---

4. Answer: d

Explanation:

Mean of 6 smallest numbers is = 15

⇒ Sum of 6 smallest numbers = 15 × 6 = 90

Mean of 14 numbers = 17

⇒ Sum of 14 numbers = 14 × 17 = 238

⇒ Sum of 8 largest numbers = 238 – 90 = 148

∴ Average of 8 largest numbers = 148/8 = 18.5

---

5. Answer: d

Explanation:

Given:

Day	11 May 2023	13 May 2024
Time	2:38 pm	2:29 pm

Concept:

Firstly we have to calculate the number of days and then the time followed by it.

For Calculate Number of Days, we have to find the exact days i.e., from 11 May 2023 to 12 May 2024 (as Time period for 13^{th} May 2024 is less than 24 hours)

Number of Days in normal year = 365 days

Number of days in leap year = 366 days (and the extra day falls on February)

Calculation:

Number of Days = 11 May 2023 to 12 May 2024 = 367 days (As 2024 is a leap year)

Time = 12th May 2024 (2:38 pm) to 13th May 2024 (2:29 pm)

The difference in Time = 23 hours 51 minutes

∴ **Required Answer** = 367 days 23 hours 51 minutes

While calculating the number of Days, we use 365 days instead of 366 days (as they considered the year is not completed).

While calculating the time duration, Many of the candidates subtracted bigger value to smaller i.e, 38 minutes - 29 minutes (which is incorrect). We have to find the time difference from 38 minutes to 60 minutes first (i.e, 22 minutes) and then added these 22 minutes in 29 minutes of the next hour. (22 + 29 = 51 minutes).

---

6. **Answer: a**

Explanation:

Conclusion 1: This follows, the proverb given in the statement, means the same as given in conclusion. Humans always do not consider their possibilities and they are not satisfied in their life.

Conclusion 2: This does not follow as anything related to the conclusion is not given in the statement.

Hence, “only conclusion 1” follows.

---

7. **Answer: c**

Explanation:

- Fakhar Zaman is the first Pakistani cricket player to score a double century in ODIs.
- He made 210 runs off 156 balls against Zimbabwe in the fourth ODI at Bulawayo in 2018. He became the sixth international batsman to make double-hundreds in ODIs.
- Batsmen who have scored double centuries in ODI- Rohit Sharma, Martin Guptill, Virendra Sehwag, Chris Gayle, Sachin Tendulkar, Fakhar Zaman.
- Rohit Sharma is the only player to score three double-centuries in ODI.

---

8. **Answer: a**

Explanation:

- Yogi Adityanath had earlier served as Priest of a temple.
- He is the current Chief Minister of Uttar Pradesh.
- He is the head priest of the Gorakhnath Math which is a Hindu temple in Gorakhpur.
- He became a disciple of Mahant Avaidyanath at the age of 21 after renouncing his family in 1993. After the death of Avaidyanath, Adityanath became the head priest.
- Vijay Rupani is the chief minister of Gujarat.
- Mayawati is the former Chief Minister of Uttar Pradesh.
- Late Manohar Parrikar served as Chief Minister of Goa. He was also the Minister of Defense.

---

9. **Answer: d**

Explanation:

Pemba Island is famous for the cultivation of **cloves**.

- This island is part of the Zanzibar Archipelago of Tanzania (coast of East Africa). It is in the Indian Ocean.

- Clove is the dried unopened flower buds of Syzygium aromaticum. Indonesia, Zanzibar, and Madagascar are the major producers of cloves.
- Clove is a tropical plant and it requires a warm humid climate. However, Cloves are best suited in deep black loam soil with high humus content found in the forest region.
- When a coffee plant is planted, it starts to produce flowers in three to four years. The cherries appear from these flowers. When the cherries ripe, it changes color from green to red and they are harvested. They are best grown in deep sandy loam. They are primarily produced in Brazil, Vietnam, Colombia, Indonesia, etc.
- Rice is one of the most cultivated crops in India as well as in Asian countries. It is a staple diet of a major part of India. It is grown successfully in humid to sub-humid regions under a subtropical and temperate climate.
- Wheat is one of the world's most commonly consumed cereal grains. Loam soil is the best for wheat cultivation.

---

10. **Answer: c**

Explanation:

- The enzyme **Trypsin** is present in the pancreatic juice, converts proteins to amino acids.
- It helps in the digestion of proteins. Trypsin breaks down proteins in the small intestine and hence continuing the process of digestion. Please note that it is produced by the pancreas in an inactive form called trypsinogen.
- Pepsin is also an enzyme in gastric juice that digests proteins. Glands in the mucous-membrane which line the stomach make and store an inactive protein known as pepsinogen. When pepsinogen is released into the stomach and mixed with gastric juice, it is converted into pepsin.
- Pepsin partially degrades proteins into smaller units called peptides.
- Lipase is also an enzyme that helps in absorbing fats. This enzyme is also released by Pancreas.
- Amylase is also an enzyme that catalyzes the hydrolysis of starch into sugars such as glucose and maltose. It made by your pancreas and by glands in and around our mouth and throat. It helps to digest carbohydrates.

11. **Answer: d**

Explanation:

- Gandhiji launched the Champaran Satyagraha in a small village called Champaran. It is in**Bihar**.
- The Champaran Satyagraha of 1917 was the first Satyagraha movement led by Gandhi.
- The satyagraha made as the farmers were forced to grow indigo without any payment for it.
- Gandhiji reached Champaran at the request of Rajkumar Shukla, where he started an effort to free the farmers suffering from the Tinkathia system.
- Gandhiji received the support of two persons Rajendra Prasad and Anugraha Narayan Sinha during this movement.

12. **Answer: b**

Explanation:

- This is a structure of **Benzene** (C_6H_6).
- It is an organic chemical compound. It is found in crude oil and is a major part of gasoline.
- It is a widely used industrial chemical. Benzene is used in making plastics,synthetic fibers, rubber lubricants, dyes, drugs, pesticides, etc.
- **Cyclohexane (C 6 H_{12})** is an alicyclic hydrocarbon comprising a ring of six carbon atoms. It is widely used as a raw material in the manufacture of nylon.
- **Cycloheptane (C_7 H14)** is also a cycloalkane and a colorless liquid. It is used to make other chemicals.
- **Naphthalene (C10 H 8)** is a polycyclic aromatic hydrocarbon. It is obtained from either coal tar or petroleum distillation. It has been used in mothballs and moth flakes.

13. **Answer: c**

Explanation:

Distance between hour hand and minute is = 5 min

As we know,

60 min = 360°

⇒ 1 min = 6°

⇒ 5 min = 5 × 6° = 30°

∴ Required angle = 30° + 25/2 = 30° + 12.5° = 42.5°

---

14. **Answer: c**

Explanation:

Let the fourth term be x

⇒ 3 : 5 :: 21 : x

⇒ 3/5 = 21/x

⇒ x = 21 × 5/3

∴ x = 35

---

15. **Answer: b**

Explanation:

Linen is a type of cloth woven from flax.

Similarly,

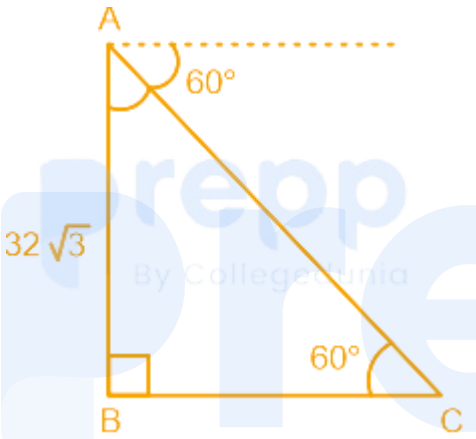
Gold is type of metal

Hence, “Metal” is the correct answer.

---

16. **Answer: a**

Explanation:



∠ PAC = ∠ ACB due to the alternate angle

Height of the tower AB = 32√3

In ΔABC

tan 60° = AB/BC

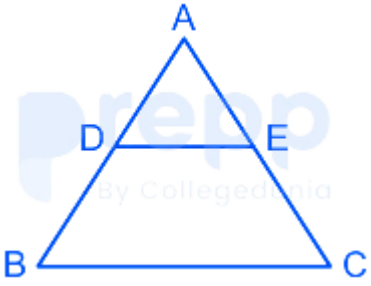
⇒ √3 = 32√3/BC

∴ BC = 32 m

---

17. **Answer: c**

Explanation:



AD = 2 cm, BD = 3 cm and AB = 2 + 3 = 5 cm

In Δ ABC

AS we know,

$\frac{ar(\Delta ADE)}{ar(\Delta ABC)} = \frac{AD^2}{AB^2}$

$\Rightarrow \frac{ar(\Delta ADE)}{ar(\Delta ABC)} = \frac{2^2}{5^2}$

$\therefore \frac{ar(\Delta ADE)}{ar(\Delta ABC)} = \frac{4}{25}$

---

18. Answer: a

Explanation:

We know, cyclicity of 3 is 4

$\Rightarrow 3^{31} = (3^4)^7 \times 3^3$

Unit digit of 3^{31}

$\Rightarrow 3^3$

$\Rightarrow 3 \times 3 \times 3$

$\Rightarrow 27$

$\therefore$ Unit digit is 7

---

19. **Answer: d**

Explanation:

	64
6	4042
+ 6	36
124	442
	- 496
	- 54

∴ If we add 54 to 4042, then the number becomes a perfect square.

---

20. **Answer: c**

Explanation:

Drawing the Venn diagram,

Conclusion 1: All brooms are handles → True (This is definitely true)

Conclusion 2: No plastic is a broom → False (This is definitely false)

Hence, "only conclusion 1" follows.

---

21. **Answer: c**

Explanation:

- The **parenchyma** consists of relatively unspecialised cell with thin cell well.
- Parenchyma tissues are a type of permanent tissue and are loosely packed. It provides support to plants and helps in the storage of food. As cells are loosely packed, large air cavities are present which gives buoyancy to the plants to help them float.
- **Phloem** is conducting tissues. It transports food from leaves to other parts of the plant. The four elements of phloem are - sieve tubes, companion cells, phloem fibres and the phloem parenchyma. Phloem cells are living cells except for phloem fibres.
- **Sclerenchyma** is also permanent tissue. It makes the plant hard and stiff. This tissue is present in stems, in the veins of leaves, and in the hard covering of seeds and nuts. Please note that the cells are dead.
- **Collenchyma**are also permanent tissue. It allows the bending of plants without breakage. These tissues are found in leaf stalks below the epidermis. Please note that cells are living.

---

22. **Answer: a**

Explanation:

Assumption 1: This is not implicit, because headmistress did not mention anything about interest in English.

Assumption 2: This is implicit, because speaking in the assembly will reduce stage fear.

Hence, “only assumption 2” is implicit.

---

23. **Answer: d**

Explanation:

- As per the RBI Annual Report 2016-17, the estimated value of demonetized banknotes received was **Rs. 15.28 lakh crore** as of June 2017.
- This amount is 99 percent of the Rs 15.44-lakh-crore scrapped currency notes.
- On November 8, 2016, the Government of India decided that the denominations of Rs. 500 and Rs. 1000 would cease to be legal tender with effect from November 9, 2016. The 86 percent of the circulation money stood not eligible for legal tender on that day.
- This move of demonetization was to stem the circulation of black money, fake currency and to choke terror funding and corruption.
- The value of banknotes in circulation declined by 20.2 percent at end-March 2017. The volume of banknotes increased by 11.1 percent, primarily due to a higher infusion of banknotes of a lower denomination in circulation.

---

24. **Answer: c**

Explanation:

- **Shanta Rangaswamy** won the BCCI Lifetime achievement award for Women at the BCCI Annual Awards held in Bengaluru in March 2017.
- She had also been a captain of the Women Cricket Team of India.
- Shubhangi Kulkarni also used to play cricket. She was the secretary of the Women's Cricket Association of India before merger with BCCI.
- **Diana Edulji** used to play Test Cricket. She is a recipient of Padma Shri.
- **Purnima Rau** was also a cricket player in the Indian Women's team.
- BCCI Lifetime achievement award for Women 2018-**Anjum Chopra**.
- The award consists of Citation, trophy and cheque for Rs. 25 lakhs.

---

25. **Answer: a**

Explanation:

Lily, Lotus and Jasmine are flowers.

Whereas,

Cantaloupe is a fruit.

Hence, “cantaloupe” does not belong to the group.

---

26. Answer: a

Explanation:

- Candidiasis is not a sexually transmitted disease.
- It is a fungal infection that affects the mouth and throat. It is generally an allergic reaction to a yeast called Candida albicans.
- **Syphilis**- It is a bacterial infection that starts as a painless sore on the genitals, rectum or mouth. It can be sexually transmitted to another person on sexual contact.
- **Gonorrhea**- It is a bacterial infection that can cause infertility. It can be transmitted through sexual contact.
- **Warts** are caused by various strains of human papillomavirus. Different strains may cause warts in different parts of the body. It can be transmitted through sexual contact.

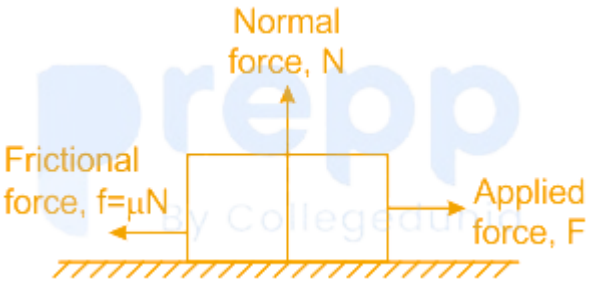
---

27. Answer: d

Explanation:

CONCEPT:

- Friction: The property of a surface that opposes the relative motion between two surfaces is called friction .



Friction (f) = μ N

Where μ is the coefficient of friction and N is the normal force

EXPLANATION:

1. Tension: It is the force which is transmitted through a rope or wire when pulled by forces acting from opposite sides. In other words, it is simply the force exerted by a string when it is subjected to pull.
2. Momentum: It is the strength contained in the object due to its motion. It is the product of the mass of an object and the velocity with which it is moving.
3. Impulse: It is the product of force and time. One can also say that it is the change in momentum.
4. If **no force is applied to a moving object, then it will stop due to Friction** . So option 4 is correct.
    - As per the **first law of motion** -" an object will remain at rest or in uniform motion in a straight line unless acted upon by an external force".
    - So, if no force is applied to a moving object, it should remain in motion as per the first law of motion. But, **it is stopped due to friction.**

---

28. Answer: b

Explanation:

Total NPAs under all the banks are = Rs. 300 lakh crores,

∴ NPA's of B = 300 × 25/100 = 75 lakh crores.

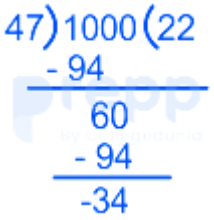
---

29. **Answer: d**

Explanation:

As we know,

The smallest four digit number is 1000



The smallest four digit number that is divisible by 47 is = 1000 + 34 = 1034

---

30. **Answer: c**

Explanation:

- When washing soda reacts with hydrochloric acid, Carbon dioxidegas is evolved.
- **Washing soda** - It is sodium carbonate. The chemical formula is Na_2CO_3. It is a natural cleaner and cleaning booster.
- Sodium carbonate, when added to water, helps to remove magnesium and calcium ions, and increases detergent efficiency.
- The following chemical reaction takes place as per the statement:-
  - $Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 + H_2O$

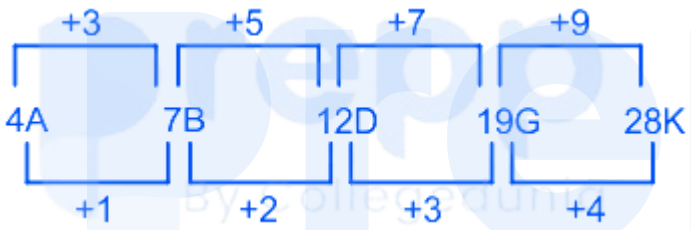
---

31. **Answer: a**

Explanation:

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

The pattern followed is,



Hence, “28K” is the correct answer.

---

32. Answer: c

Explanation:

Area of square field = 31684 m^2

⇒ Side of the square = √31684 = 178 m

Perimeter of the field = 4a = 4 × 178 = 712 m

Total length of wire = 4 × 712 × 21/20 = 2990.4 m

---

33. Answer: b

Explanation:

CONCEPT:

- Kinetic energy (KE): The energy possessed by a body by virtue of its motion is called kinetic energy .

$KE = \frac{1}{2}mv^2$

Where m = mass of the body and v = velocity of the body

EXPLANATION:

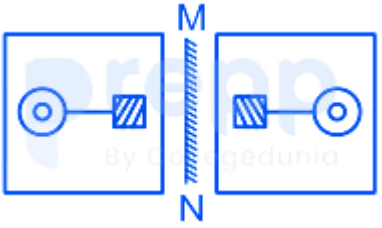
- $KE = \frac{1}{2}mv'^2 = \frac{1}{2}m(2v)^2 = 2mv^2$
- As the **kinetic energy is directly proportional to the square of the velocity** . S o if the **velocity becomes twice, the kinetic energy would be four times** (square of twice gives four).
- Since we have a cycle that will not change, so there is no change in mass.

---

34. Answer: b

Explanation:

The mirror image for the following figure when the mirror is kept at the MN line is,



Hence, option 2 is the correct answer.

---

35. Answer: d

Explanation:

- Avogadro number is represented by **NA**.
- It is an absolute number. It represents the number of units in one mole of any substance.
- It is equal to **$6.02214076 \times 10^{23}$**.
- Now, the units can be anything-electrons, atoms, ions, or molecules.
- Avogadro's law states that equal volumes of different gases contain an equal number of molecules under the same conditions of temperature and pressure. It can be derived from the ideal gas equation.
- If V is the volume of the gas and n denotes the amount of gaseous substance (moles), V/n would be constant. It means that the ideal gas constant is the same value for all gases.

---

36. Answer: a

Explanation:

The correct answer is Option **1**, i.e **Terbium**.

- **Actinide series** of periodic tables contains **15 elements** with **atomic numbers from 89 to 103**.
- The general symbol of these elements is An.
- **Terbium** is **not an actinoid**. Its atomic number is 65 and its atomic symbol is Tb.
- Actinoid elements are radioactive and very poisonous. Every actinoid isotope also undergoes radioactive decay.
- **These are the elements in the series** - Actinium (Ac), **Thorium (Th)**, Protactinium (Pa), Uranium (U), Neptunium (Np), Plutonium (Pu), Americium (Am), Curium (Cm), Berkelium (Bk), Californium (Cf), Einsteinium (Es), **Fermium (Fm)**, Mendelevium (Md), **Nobelium (No)**, and Lawrencium (Lr).

---

37. Answer: a

Explanation:

- 'Kalamkari', a Painting form belongs to **Andhra Pradesh**.
- It is a 3000-year-old art form practiced in Andhra Pradesh and Telangana.
- It refers to the ancient style of hand painting, done with a tamarind pen using natural dyes. It is primarily done on cotton or silk fabric.
- The art primarily uses earthy colors like indigo, mustard, rust, black, and green.
- There are 23 steps to complete this painting which include dyeing, bleaching, hand painting, block-printing, starching, cleaning, and more.
- There are a variety of motifs drawn in this painting-flowers, peacock, paisleys to divine characters of Hindu epics like Mahabharata and Ramayana.
- However, nowadays, this art can be seen as Kalamkari sarees also.

---

38. Answer: a

Explanation:

Given:

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

Formula Used:

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

$(a + b)^2 = a^2 + b^2 + 2 \times a \times b$

Calculation:

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

$\Rightarrow 2x = \sqrt{3} + 1$

$\Rightarrow 2x - 1 = \sqrt{3}$

On squaring,

$(2x - 1)^2 = 3$

$\Rightarrow 4x^2 + 1 - 4x = 3$

$\Rightarrow 4x^2 - 4x - 2 = 0$ ----(i)

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

$\Rightarrow 2x^2 = (2x + 1)$ ----(ii)

Now,

$4x^3 + 2x^2 - 8x + 7$

$\Rightarrow 2x^2 (2x + 1) - 8x + 7$

$\Rightarrow (2x + 1) \times (2x + 1) - 8x + 7$

$\Rightarrow (2x + 1)^2 - 8x + 7$

$\Rightarrow 4x^2 + 1 + 4x - 8x + 7$

$\Rightarrow 4x^2 - 4x + 8$

$\Rightarrow 2 \times (2x^2 - 2x) + 8$

$\Rightarrow 2 \times 1 + 8$

$\Rightarrow 10$

∴ The value of $4x^3 + 2x^2 - 8x + 7$ is 10.

---

39. Answer: a

Explanation:

- An element has an atomic number of 20. Beryllium would show similar chemical properties as the element.

- Calcium has atomic number 20. Beryllium has atomic number 4.
- Two different elements are likely to have similar chemical properties when they have the same number of valence electrons.
- Beryllium has 2 valence electrons and calcium also has 2 valence electrons.
- The vertical columns on the periodic table which are called groups have similar chemical behavior.
- Beryllium and calcium are in the second group of the periodic table.

---

40. Answer: b

Explanation:

- NTPC had adopted the maintenance of Charminar in Hyderabad as part of the Swachh Bharat Mission in 2018.
- NTPC Ltd and the Greater Hyderabad Municipal Corporation had signed a memorandum of understanding for implementation of development and beautification works under the Charminar Pedestrianization Project in Hyderabad.
- As per the MoU, the work included providing battery-operated vehicles for visitors, bollards to prevent traffic, Swachh Auto Tippers for carting garbage, mechanical sweeping vehicles and litter picking machines, decorative and halogen lighting of four arches, construction of public utilities, toilets and drinking water ATM kiosks.
- Charminar was constructed by Muhammad Quli Qutb Shahi in 1591 AD. It lies near the bank of the river Musi.
- It is believed that he made it construct to celebrate the end of a deadly plague.

---

41. Answer: d

Explanation:

- Hydrogenis the only non-metal present in Group 1 of the Modern Periodic Table.

- The vertical columns in periodic table is called a group and horizontal row is called period.
- There are 18 groups and 7 periods in modern periodic table.
- The elements in one group share similar chemical properties because they have same number of valence electrons.
- Group 1 contains alkali metals with the exception of hydrogen. The alkali metals are lithium, sodium, potassium, rubidium, cesium, and francium.
- Since hydrogen shares the same electronic configuration as with other elements of group 1, it is placed there.
- Cobalt atomic number-27 and symbol Co. It is in group 9.
- Rubidium atomic number-37 and symbol Rb. It is in group 1.
- Potassium atomic number-19 and symbol K. It is in group 1.

---

42. Answer: b

Explanation:

CONCEPT:

- Force: The interaction which after applying on a body changes or try to change the state of rest or state of motion of the body is called force.

Force (F) = Mass (m) × acceleration (a)

- Retardation : The force acting in the opposite direction to the motion of a body is called the retarding force . This force produces negative acceleration for the body which is called retardation or deacceleration .

Retardation (a) = Force/Mass

The equation of motion is given below:

V = u + a t

Where V is final velocity,C is initial velocity, a is acceleration and t is time

CALCULATION:

Given that:

Mass (m) = 30 kg, Initial velocity (u) = 20 m/s

Force (F) = - 60 N

Acceleration (a) = F/m = - 60/30 = - 2 m/s 2

Final velocity (V) = 0 m/s

- We know that body is stopped, it means the final velocity is 0.

V = u + a t

0 = 20 + (-2)t

2t = 20

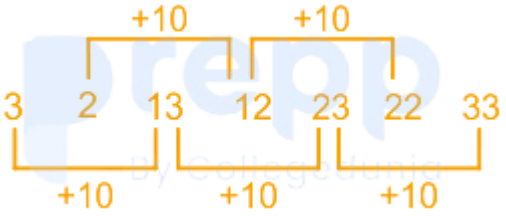
Time taken (t) = 10 seconds. So option 2 is correct.

---

43. Answer: a

Explanation:

The pattern followed is,



Hence, “33” is the correct answer

---

44. Answer: c

Explanation:

The pattern followed is,

The given figure consists of four symbols.

The first three symbols are moving by one place towards their right and the fourth symbol is constant.

The figure which will come next in the pattern is,

Hence, option 3 is the correct answer.

---

45. Answer: a

Explanation:

CONCEPT :

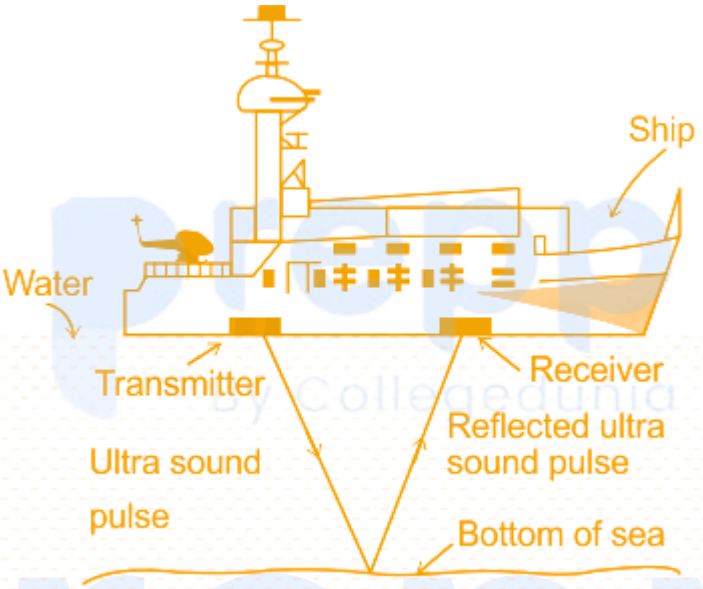
- **Echo** : If we shout or clap near a suitable reflecting object such as a tall building or a mountain, we will hear the same sound again a little later. This sound which we hear is called an echo.
    - Echoes are heard due to the phenomenon of Reflection of sound waves .
    - To hear the echo clearly, the reflecting object must be more than 17.2 m from the sound source for the echo to be heard by a person standing at the source.

EXPLANATION :

- **Echoes are heard due to the phenomenon of reflection of sound.** So option 1 is correct.
- In the case of **resonance, interference, and refraction of sound there is no echo** . So options 2, 3, and 4 are wrong.

⭐ Important Points

- **SONAR** (sound navigation ranging) **uses the principle of reflection of soundwaves** and submarine can detect objects nearby or distant.



- Echolocation is widely used by bats and whales.
- Bats cannot see but they send out waves from the mouth or nose and perceives the echo to know to the approximate distance of the object.
- Most mammals like whales produce high-frequency sound or sonar clicks. Whales can recognize the size of the object and the distance almost instantly when they receive echo.
- The velocity of sound in dry air is approximately 343 m/s at a temperature of 25 °C.

---

46. Answer: d

Explanation:

- A Papaya is a unisexual flower.
- A unisexual flower would either have stamens or carpels. But it can never possess both together.
- Stamen is the male fertilizing organ of a flower and carpel is the female fertilizing organ of a flower.
- Simply, we can say that it can either be male flower or female flower.

- Coconut flowers, Watermelon, Cucumber, Maize, etc are some examples of unisexual flower.
- Gulmohar is widely grown as a street tree or an ornamental tree because it is very colorful. It is also known as royal poinciana.
- Hibiscus are large colorful flowers. The flowers and leaves can be made into teas and liquid extracts that can help treat a variety of conditions.
- Mustard plant is yellow in color and can produce seed in as few as 60 days. The seeds of mustard plants are widely used in spices.

---

47. Answer: a

Explanation:

Jupiter and earth are planets.

Vegetation is found mainly on earth.

The correct Venn diagram representation is,Hence, option 1 is the correct answer.

Hence, option 1 is the correct answer.

---

48. Answer: b

Explanation:

- Anil K.Tripathi had been awarded “Bharat Gaurav Award” 2017 in Science and Technology category.
- He is a Director at Institute of Science & Professor, School of Biotechnology, Banaras Hindu University.

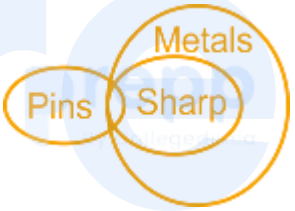
- He won the award in 2017 as recognition for his meritorious achievements, outstanding performance and individual excellence throughout his life.
- In 2012, Sanskriti Yuva Sanstha started “Bharat Gaurav Award” as a felicitation program for people from all our World who achieve a landmark in their working area and made India proud.
- First ‘Bharat Gaurav Award' Ceremony was held in 2012 at Hotel Hilton ,New Jersey,USA.

---

49. Answer: b

Explanation:

Drawing the Venn diagram,



Conclusion 1: All metals are pins → False (This is definitely false)

Conclusion 2: Some metals are sharp → True (This is definitely true)

Hence, “only conclusion 2” follows.

---

50. Answer: a

Explanation:

The correct answer **a double covalent bond** .

⭐ Key Points

- A molecule of Oxygen has a**double covalent bond**.
- A covalent bond is a chemical bond in which atoms share electron pairs. There is a balance of attractive and repulsive forces between atoms.
- In a double covalent bond, two pairs of electrons are shared between the atoms.
- As in the case of Oxygen (Atomic number 8), it has six valence electrons. Each O atom of the oxygen molecule shares 2 electrons to form two covalent bonds. This way, both oxygen atoms complete their octet and achieve stable structures.
- Three pairs of electrons are shared between the two combining atoms in a triple covalent bond.
- In an electrovalent bond, one atom loses an electron to form a positive ion and the other atom gains the electron to form a negative ion. And since these ions are oppositely charged, these are held by electrostatic attraction forming an electrovalent bond.

---

51. Answer: c

Explanation:

As we know,

Area of the square = a^2

⇒ New side of the square = a × 130/100 = 1.3a

New area of the square = $(1.3a)^2 = 1.69a^2$

⇒ Area increased by = $1.69a^2 - a^2 = 0.69a^2$

∴ Area increased by = $0.69a^2/a^2 \times 100 = 69\%$

---

52. Answer: d

Explanation:

- When phenolphthalein is added to vinegar, the solution becomes **colourless**.
- Phenolphthalein- $C_{20}H_{14}O_4$.
- It is used as an indicator in acid-base titrations.
- When ph is put in a basic solution, it turns pink and when it is put in acidic solution, it turns colorless.
- Hence, it remains colourless below pH 8.5 and attains a pink to deep red hue above pH 9.0.
- Vinegar is nothing but an aqueous solution of acetic acid (CH_3COOH).
- That is why the solution would remain colorless as ph shows no change in acidic solutions.

---

53. Answer: b

Explanation:

As we know

velocity = distance/time

⇒ 60 = 480/time

⇒ time = 480/60

∴ Time = 8 s

---

54. Answer: b

Explanation:

Total goal of Team A = 2 + 1 + 1 + 4 = 8

∴ Average goal of Team A = 8/4 = 2

Total goal of Team B = 3 + 2 + 2 + 5 = 12

∴ Average goal of Team B = 12/4 = 3

---

55. Answer: a

Explanation:

- Jairam Ramesh is the author of the book 'Indira Gandhi – A Life in Nature'.
- It was published in 2017 and Simon & Schuster India was the publisher.
- This book includes the personal, political, and environmental history of Indira Gandhi. Jairam has talked about how her views on the environment remained steadfast even as her political and economic stances changed and she took significant decisions particularly regarding forests and wildlife.
- Jairam Ramesh is a Member of Parliament representing Karnataka state in the Rajya Sabha.
- Other books by him - Old History, New Geography: Bifurcating Andhra Pradesh (2016), To the Brink and Back: India's 1991 Story (2015), Legislating for Justice: The 2013 Land Acquisition Law (2015), Green Signals: Ecology, Growth and Democracy in India (2015), etc.
- Books by Natwar Singh - One Life is enough, Treasured Epistles, Profiles and Letters, etc.
- Books by Sonia Gandhi - Rajiv, Rajiv's World, etc.
- Book by Priyanka Vadra - Ranthambhore: The Tiger's Realm

---

56. Answer: a

Explanation:

Statement 1: Number of students is not given in this statement.

Statement 2: This is sufficient, because it is mentioned that there are 6 girls and 8 boys in the class.

Hence, “only 2” is sufficient.

---

57. Answer: d

Explanation:

Length of the train = 156.5 m, and let length of platform be x m

Speed of train = 57 km/hr

As we know,

Speed = distance/time

$\Rightarrow 57 \times 5/18 = (156.5 + x)/39$

$\Rightarrow 57 \times 5/18 \times 39 = 156.5 + x$

$\Rightarrow 617.5 = 156.5 + x$

$\Rightarrow x = 617.5 - 156.5$

$\therefore x = 461$ m

---

58. Answer: c

Explanation:

In all the figures, except in figure B the outer figure has four sides.

Whereas,

In figure B the outer figure has 6 sides.

Hence, figure “B” is the odd one.

---

59. **Answer: a**

Explanation:

The given figure has two circles on the outer layer and a sphere immersed inside them.

Similarly,

Figure C also has two circles and a sphere immersed in it.

Figure C resembles the given figure.

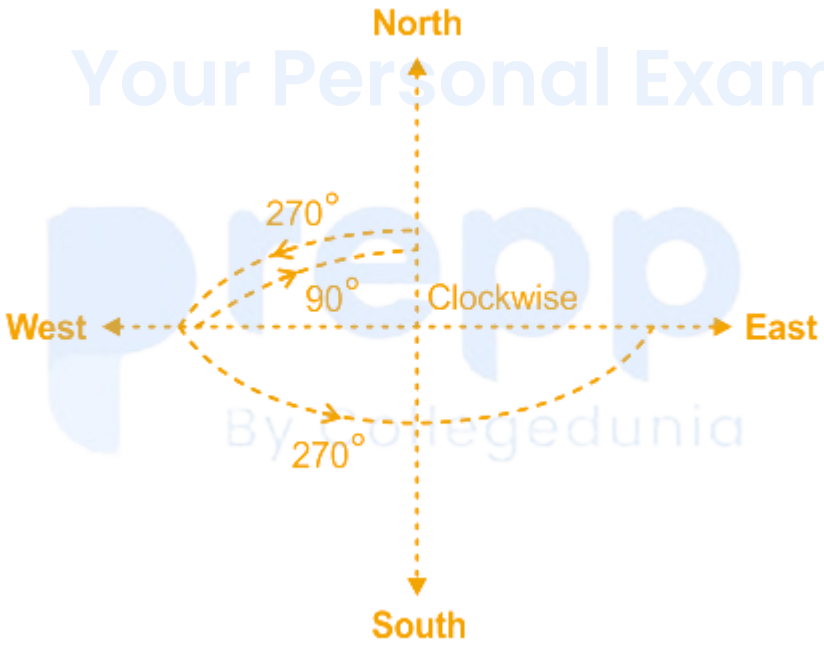
Hence, option 1 is the correct answer.

---

60. **Answer: a**

Explanation:

Drawing diagram according to the given information,



He is facing 'east' now.

Hence, "east" is the correct answer.

---

61. Answer: b

Explanation:

- S. S. Rajamouliis the director of the blockbuster movie 'Bahubali'.
- Baahubali: The Beginning was made in 2015 and it was shot in both Telugu and Tamil.
- The film was made on a budget of Rs. 180 crore and it was the most expensive movie at that time.
- It is the highest-grossing South Indian film and it is the third highest-grossing Indian film worldwide.
- It also won the National Film Award for Best Special Effects and Best Feature Film.
- In 2017, the director came with the sequel named "Baahubali 2: The Conclusion". This movie became the second highest-grossing Indian film worldwide.
- The first position is held by Aamir Khan's Dangal.

---

62. Answer: b

Explanation:

CONCEPT:

- **Momentum:** The product of the mass and velocity of an object is called momentum. It is denoted by P.

Momentum (P) = Mass (m) × Velocity (v)

- **Newton's Second law of motion**: The rate of change of momentum of any object is directly proportional to the **applied force** on the body.

$$\text{Force } (F) = \frac{\Delta P}{\Delta t}$$

Where Δ P = Change in momentum and Δ t = change in time taken

EXPLANATION:

- According to **Newton's second law of motion**, the **rate of change of momentum of a body is directly proportional to the Applied force.** So option 2 is correct.

---

63. Answer: d

Explanation:

- Bakelite is a kind of synthetic plastic whereas other are metals and alloys. Hence, **Bakelite** does not belong to the group.
- Bakelite is obtained by the polymerization of phenol and formaldehyde.
- Chemical Formula of Bakelite-$(C_6H_6O\text{-}CH_2OH)_n$.
- Leo Baekeland created Bakelite. He has also invented Velox photographic paper.
- Bakelite is a thermosetting resin and it can be molded very easily. It shows high resistance to electricity and heat, hence it was used for all non-conducting parts of radios and other electrical devices.
- Atomic number of Aluminium- 13. Symbol-Al.
- Atomic number of Iron- 26. Symbol-Fe.
- Brass is an alloy of copper and zinc.

---

64. Answer: b

Explanation:

The pattern followed is,

In the first figure there are two triangles and in the second figure there is a triangle inside the triangle.

Similarly,

There are two circles in the third figure and in the fourth figure there must be a circle inside a circle.

The pattern followed is,

Hence, option 2 is the correct answer.

---

65. Answer: a

Explanation:

- The element of the Lanthanide series having the atomic number 58 is **Cerium** .
- This series has 14 elements from atomic number 57 to 71. They are also called "rare earth elements".
- Lanthanides and Actinides are the only elements that fill the f-orbitals.
- The elements of Lanthanide series are very difficult to extract. The isolation of an individual element may involve hundreds of fractional crystallizations.
- These elements are used as alloys to impart strength and hardness to metals.
- The elements are- lanthanum, cerium , praseodymium , neodymium , promethium , samarium , europium , gadolinium , terbium , dysprosium , holmium , erbium , thulium , ytterbium , and lutetium .
- Thorium is a weak radioactive element. Symbol -Th and Atomic number -90.

---

66. Answer: a

Explanation:

CONCEPT:

- Resistance: The property of any conductor that opposes the flow of electric current through it is called resistance.
  - It is denoted by R and the SI unit is the ohm (Ω).
  - Superconductors are said to have zero resistance.
  - One can control Voltage and Current by altering the resistance of the circuit.

The resistance (R) is given by:

$R = \rho L/A$

where ρ is resistivity, L is the length and A is the area of the cross-section.

EXPLANATION:

1. The **resistance of a conductor does not depend on Pressure**. So option 1 is correct.
2. Conductors show less resistance and Insulators show very high resistance. So **it depends on the material**.
3. It is **inversely proportional to the cross-sectional area** of the wire.
4. The **resistance is directly proportional to the length** of the wire and resistivity of the material used in making the wire.

---

67. Answer: d

Explanation:

Drawing the Venn diagram,

Conclusion 1: All flowers are soft → True (This is definitely true)

Conclusion 2: Some soft are petal → True (This is definitely true)

Hence, "both conclusions" follow.

---

68. Answer: b

Explanation:

Satheesh reads a novel in = 6 days

On each day he reads it = $1\frac{3}{4} = \frac{7}{4}\ hrs$

∴ Total hours taken by him to read the whole book = 7/4 × 6 = 21/2 = $10\frac{1}{2}$ hrs

---

69. Answer: b

Explanation:

- Kisan Urja Suraksha evam Utthaan Mahaabhiyan (KUSUM) has been launched by the union government for promoting solar farming.
- It was approved by the Cabinet Committee on Economic Affairs, chaired by Hon'ble Prime Minister Shri Narendra Modi in 2019.
- The objective of the scheme is to provide financial and water security to farmers.
- There are three components of the scheme :-
  - 10,000 MW of Decentralized Ground Mounted Grid Connected Renewable Power Plants.
  - Installation of 17.50 lakh standalone Solar Powered Agriculture Pumps.

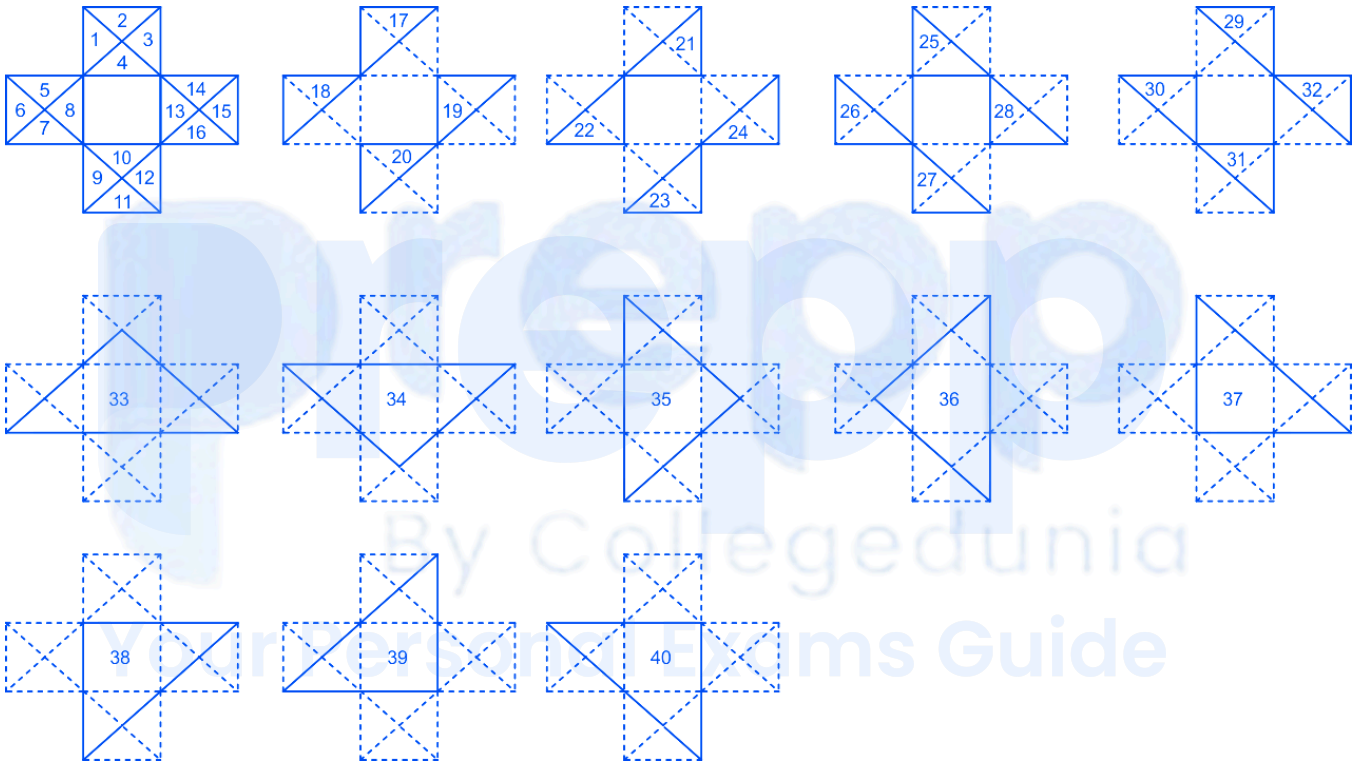
- Solarisation of 10 Lakh Grid-connected Solar Powered Agriculture Pumps.
- The scheme aims to add a solar capacity of 25,750 MW by 2022.

---

70. Answer: b

Explanation:

The number of triangles in the given figure is,



Hence, “40” is the correct answer.

---

71. Answer: c

Explanation:

Let Ritika's present age be "x".

Priyamvada's present age is five years more than twice the age of his cousin Ritika.

∴ Priyamvada's present age = 2x + 5

After 16 years,

Ritika's age will be "x + 16"

and Priyamvada's age will be "2x + 5 + 16" i.e. 2x + 21.

Priyamvada's age will be 150% of that of Ritika's age.

From the above condition,

2x + 21 = 150% of (x + 16)

(2x + 21) × 100 = 150 × (x + 16)

∴ 200x + 2100 = 150x + 2400

∴ 200x - 150x = 2400 - 2100

∴ 50x = 300

∴ x = 6

Hence, Ritika's present age is 6 years.

Whereas, Priyamvada's present age will be,

(2 × 6) + 5 = 17

Hence, 17 is the correct answer.

---

72. Answer: d

Explanation:

P = Rs. 1250, t = 15 years, and r = 1.6%

As we know,

SI = (P × r × t)/100

⇒ SI = (1250 × 1.6 × 15)/100

∴ SI = Rs. 300

---

73. Answer: d

Explanation:

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

The pattern followed is,

Hence, “KK” is the correct answer.

---

74. Answer: b

Explanation:

The correct answer is National Payments Corporation of India.

⭐ Important Points

- NPCI-National Payments Corporation of India.
- It is an umbrella organization for operating retail payments and settlement systems in India.
- It is an initiative of the RBI and Indian Banks' Association under the provisions of the Payment and Settlement Systems Act, 2007. It is registered under section 8 of the Companies Act 2013.
- It intends to provide infrastructure to the entire Banking system in India for physical as well as electronic payment and settlement systems.
- The ten core promoter banks are State Bank of India, Punjab National Bank, Canara Bank, Bank of Baroda, Union Bank of India, Bank of India, ICICI Bank, HDFC Bank, Citibank N. A. and HSBC.
- MD and CEO-Dilip Asbe.

---

75. Answer: c

Explanation:

Speed of two horses is 10 km/hr and 15 km/hr.

Let the distance be d

According to the question

$d/10 - d/15 = 12/60$

$\Rightarrow (3d - 2d)/30 = 12/60$

$\therefore d = 6$ km

---

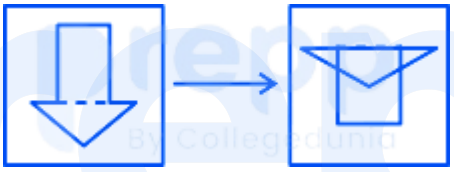
76. **Answer: a**

Explanation:

⭐ Important Points

- Do not get tensed by the complexity of the figures .
- Carefully understand the structure of the given question figure.
- The embedded figure may not be of exact size. It may be small or big.
- Sometimes the rotation or reflection of the figures may be confusing.
- So think wisely before selecting the answer.

When the sheet is folded at the dotted line it resembles,



Hence, option 1 is the correct answer.

---

77. **Answer: b**

Explanation:

⭐ Key Points

- In animal cells, Cuboidal epithelium forms the inner lining of the kidney to provide mechanical support.
- Cuboidal epithelium is a single layer thick and made of cube-shaped cells. This tissue is found lining parts of the body such as the kidney tubules and walls of the respiratory bronchioles.
- Glandular epithelium-It is a type of epithelial tissue that covers the exocrine and endocrine glands.
- Columnar epithelium- These tissues are made of a single layer of long epithelial cells in regions where absorption and secretion are important. They

also form the lining of the stomach and intestines.
- Squamous epithelium- It is a single layer of flat cells. These are in contact with the basal lamina of the epithelium. The tissues are permeable and occur where small molecules need to pass through membranes via diffusion.

---

78. Answer: d

Explanation:

- Kandaleru Dam is located in **Andhra Pradesh**.
- It is built on the Kandaleru River in Rapur Mandal, Nellore district.
- It is primarily built for irrigation purposes. This dam was a part of the Telugu Ganga project which basically supplies drinking water to Chennai city from the Srisailam reservoir on Krishna River.
- Other dams in Andhra Pradesh - Nagarjuna Sagar Dam, Srisailam Dam, etc.
- Dams in Kerala - Idukki Dam, Mullaperiyar Dam, Kakkayam Dam, etc.
- Dams in Tamil Nadu - Mettur Dam, Sholayar Dam, etc.
- Dams in Karnataka - Tungabhadra Dam, Almatti Dam, etc.

---

79. Answer: c

Explanation:

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

The pattern followed is,

For LET,

The place value for L is 12

The place value for E is 5

The place value for T is 20

So,

Let is coded as 12520

Similarly,

For WIN,

The place value for W is 23

The place value for I is 9

The place value for N is 14

WIN is coded as 23914

Hence, "**23914**" is the correct answer.

---

80. Answer: b

Explanation:

Let total profit be x

According to the question

$x \times 40/100 = 10,00,000$

$\Rightarrow x = 10,00,000 \times 100/40$

$\Rightarrow x = 25,00,000$

$\therefore$ Profit share of Ashank $= 25,00,000 \times 60/100 = 15,00,000$

---

81. Answer: b

Explanation:

Ratio of mixture of sugar and flour = 4 : 7

⇒ 4 + 7 = 11 unit

⇒ 11 unit = 22 kg

⇒ 1 unit = 2 kg

⇒ 4 unit = 2 × 4 = 8 kg

⇒ 7 unit = 2 × 7 = 14 kg

Quantity of sugar in the dough = 8 kg

Quantity of flour in the dough = 14 kg

Let quantity of flour added be x

According to the question

8/(14 + x) = 2/5

⇒ 40 = 28 + 2x

⇒ 2x = 40 – 28

⇒ x = 12/2

⇒ x = 6 kg

∴ Justine later on added 6 kg of flour

---

82. Answer: d

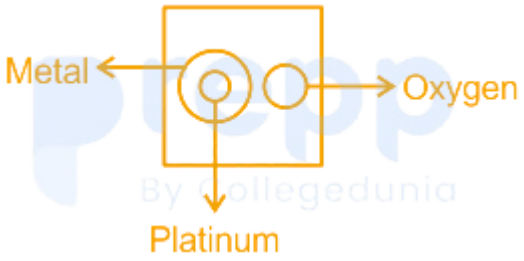
Explanation:

Platinum is a metal.

And,

Oxygen is a colourless, odourless gas.

The correct Venn diagram representation is,



Hence, option 4 is the correct answer.

---

83. Answer: a

Explanation:

28.8 km less than that of 42.3 km = 42.3 – 28.8 = 13.5 km

---

84. Answer: c

Explanation:

$\sqrt{16} = 4$

$\sqrt[6]{1} = 1$

$\sqrt[4]{4} =$ We cannot write this in fractions or integers.

$\sqrt[3]{8} = 2$

$\therefore \sqrt[4]{4}$ is irrational numbers.

---

85. **Answer: b**

Explanation:

CONCEPT:

- **Sound** : The sound is a **longitudinal wave** in which the particles of the medium through which the sound is transported vibrate parallel to the direction that the sound wave moves.
- **Loudness** : The phenomenon of sound waves that depend on the amplitude and energy of the sound wave is called Loudness.
    - When the **amplitude of the sound is large, then the sound wave is considered to be loud** .

1. Frequency : The number of wave cycles happening per second is called frequency.
2. **Amplitude** : The maximum amount of displacement of the medium particles from its mean position is called the amplitude of the wave.
3. Wavelength : The distance between two adjacent maxima or two adjacent minima of a wave is called wavelength of that wave. It is denoted by λ.
4. **Pitch** : The response of the ear to the frequency of sound is called the pitch of the sound.

EXPLANATION:

- Sound is a wave and a high amplitude wave carries a large amount of energy. It means a low amplitude wave carries a small amount of energy.
- The loudness of a sound wave is directly proportional to the square of the amplitude of that wave.
- The **loudness of the sound produced by a radio increases by increasing the amplitude** . So option 2 is correct.

---

86. **Answer: d**

Explanation:

Assumption 1: This is implicit, because safety, quality and nutritional value of the food we eat is of fundamental importance to our health and well-being.

Assumption 2: This is not implicit because, nothing is mentioned about monitoring in the given statement.

Hence, "only conclusion 1" is implicit.

---

87. Answer: d

Explanation:

$92 - [71 + \{4 - (5 - (4 - 2))\}]$

$\Rightarrow 92 - [71 + \{4 - (5 - 2)\}]$

$\Rightarrow 92 - [71 + \{4 - 3\}]$

$\Rightarrow 92 - [71 + 1]$

$\Rightarrow 92 - 72$

$\Rightarrow 20$

---

88. Answer: a

Explanation:

- Sh. Amitabh Kantis the former CEO of NITI Aayog.
- NITI-National Institution for Transforming India
- He has also written a book-"Branding India – An Incredible Story".
- NITI Aayog is a policy think tank of the Government of India which replaced Planning Commission of India. It was established with the aim at

achieving sustainable development goals with cooperative federalism by fostering the involvement of State Governments in the economy policies.
- One of the objectives of NITI Aayog is to develop mechanisms to formulate credible plans at the village level and aggregate these progressively at higher levels of government.

⭐ Important Points

- Chairman - PM Narendra Modi
- Suman Bery is the current vice-chairperson of the NITI Aayog.
- Currently, Parameswaran Iyer is the CEO of NITI Aayog appointed in June 2022.

---

89. **Answer: a**

Explanation:

CONCEPT:

- Potential energy : The energy of any object due to its position with respect to a reference point is called potential energy. It is denoted by PE.

Potential energy is given by:

PE= m g h .

Here, PE is the Potential Energy, m is the mass, g is the acceleration due to gravity, and h is the height at which the object is placed

CALCULATION:

Given that:

Mass (m) = 50 Kg

Height (h) = 6 m

PE = 50 x 10 x 6

PE = 3000 J

PE = 3 kJ

Important Point

- Kinetic energy: The energy due to the motion of the object is called kinetic energy.

Kinetic energy (KE) = 1/2 (mv 2)

Where m is mass and v is velocity.

- Since the object is stationary (at rest) so the velocity is zero. Hence the kinetic energy of the object will be zero .
- Only the potential energy of the object will be there at the height.

---

90. Answer: d

Explanation:

- India signed a pact with **Myanmar** for the socio-economic development of Rakhine State in Dec 2017.
- At that time, hundreds of thousands of mainly Muslim Rohingyas had fled from Rakhine(a predominantly Buddhist region) to Bangladesh.
- The memorandum of understanding was signed between S. Jaishankar and U. Soe Aung.
- It was intended to help Myanmar achieve its objective of restoration of normalcy in Rakhine State and enable the return of displaced persons.
- The GoI proposed to take up a project to build prefabricated housing in Rakhine State.
- Myanmar Capital - Naypyitaw
- Currency - Burmese kyat

---

91. **Answer: b**

Explanation:

Let the present age of Srinivas's daughter is "x",

Hence, Srinivas's present age is "4x",

5 years ago,

Srinivas's daughter's age was "x - 5",

and Srinivas's age was "4x - 5".

According to the given condition,

Srinivas was nine times as old as his daughter was at that time.

$\therefore 9 (x - 5) = 4x - 5$

$\therefore 9x - 45 = 4x - 5$

$\therefore 9x - 4x = 40$

$\therefore 5x = 40$

$\therefore x = 8$

Hence, Srinivas's daughter's present age is '8' years.

---

92. **Answer: b**

Explanation:

The correct answer is Option **2**, i.e **Isotopes**.

- **Isotopes** have similar chemical properties but different atomic masses.

- Isotope of an element has a different number of neutrons but have the same number of protons.
- For instance, isotopes of Hydrogen are Protium, Deuterium and Tritium.
- **Isomers** - They share the same formula but a different arrangement of atoms in the molecule which make them, possess different properties. The atomic number and atomic mass are equal but the energy states are different.
- **Actinides** - It is the third group in the periodic table. These are the elements from atomic numbers 89 to 103.These have properties of both the d-block and the f-block elements, but they are also radioactive.
- **Isobars** -They have the same mass number but a different atomic numbers (number of protons).

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93. **Answer: d**

Explanation:

- The regulation was passed on1829to ban the practice of Sati.
- The Sati was practiced primarily by Hindu communities where a widow was supposed to be burn with her dead husband either voluntarily or non voluntarily.
- **Raja Rammohan Roy** raised his voice against this cruel practice and spread awareness among people to discontinue it. He is also known as the pioneer of women's rights in India.
- **Lord William Bentinck** passed the Bengal Sati Regulation in all jurisdictions of British India.
- However, it is believed that many mughal emperors such as Humayun, Akbar, Aurangzeb, etc tried to abolish Sati.

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94. **Answer: b**

Explanation:

- India won the 2017 Women's Hockey Asia Cup title. It was the ninth edition of the cup.
- The winner of this tournament was to qualified for the 2018 World Cup in England and India qualified for it.
- The team was led by Skipper Rani Rampal.
- The final was played at Kakamigahara in Japan. India defeated China by 5-4 goals in penalty shootout.
- That win made India two times champion of Women's Asia Cup title. The first time was in 2004.

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95. Answer: c

Explanation:

Assumption 1: This is implicit, because participation in the debate improves convincing skills.

Assumption 2: This is implicit, because participation in the debate improves communication skills.

Hence, "both 1 and 2" are implicit.

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96. Answer: c

Explanation:

- Shah Rukh Khan has been awarded Crystal award on 22nd January 2018 at WEF, World Economic forum Annual Summit held at Davos.
- He was awarded for his leadership in championing children's and women's rights in India
- The theme of the event was-"Creating a Shared Future in a Fractured World".
- Cate Blanchett was also awarded for her leadership in raising awareness of the refugee crisis.
- Elton John was also awarded for his leadership in the fight against HIV/AIDS.

- Theaster Gates, Jin Xing, **Deepika Padukone,** and Lynette Wallworth are named as 2020 Crystal Award.
- Deepika Padukone is named for her leadership in raising mental health awareness.

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97. Answer: b

Explanation:

125, 343 and 216 are the cubes of 5, 7 and 6.

Whereas,

100 is the square of 10

Hence, "100" is different from other options.

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98. Answer: c

Explanation:

As we know,

In the rectangle the diagonals are equal and divide each other equally.

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99. Answer: a

Explanation:

In all the figures, except figure D there are two arrows marks pointing towards different sides.

Whereas,

In figure D there is only one arrow mark.

Hence, "D" is the odd one.

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100. Answer: b

Explanation:

Given:

Mean (100 observations) = 50

Formula:

Mean = Sum of all observations/Number of observations

Calculation:

Sum of 100 observations = 100 × 50 = 5000

Let the sum of 99 observations which were not replaced be 'x'

⇒ 100 th observation = 5000 − x = 60

⇒ x = 4940

Now,

Sum of all observations (new) = x + 160 = 4940 + 160 = 5100

∴ Required mean = 5100/100 = 51