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RRB Group D 2022 Prev. Yr. Paper (26 Aug 2022) (Shift 3)

Total Time: 1 Hour : 30 Minute **Total Marks:** 100

Instructions

1. Test will auto submit when the Time is up.
2. The Test comprises of multiple choice questions (MCQ) with one or more correct answers.
3. The clock in the top right corner will display the remaining time available for you to complete the examination.

Navigating & Answering a Question

1. The answer will be saved automatically upon clicking on an option amongst the given choices of answer.
2. To deselect your chosen answer, click on the clear response button.
3. The marking scheme will be displayed for each question on the top right corner of the test window.

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Test

1. Consider the below statements and identify the correct answer. **(+1, -0.33)**

   Statement-I: Salts of strong acid and a strong base are neutral with pH value of 7.

   Statement-II: Salts of a strong acid and weak base are acidic with pH value less than 7.

   a. Statement-I is true, and Statement-II is false.

   b. Both the statements are true.

   c. Statement-II is true, and Statement-I is false.

   d. Both the statements are false.

---

2. Which compounds are required to manufacture baking soda? **(+1, -0.33)**

   a. Sodium hydroxide and water

   b. Water and sodium carbonate

   c. Water and bleaching powder

   d. Common salt, carbon dioxide, and ammonia

---

3. If for x > 0, the mean of 22.5, 56, 42.5, 2x+1, x-2, 3x, 36 is 30, then the value of x is _____. **(+1, -0.33)**

   a. 9

   b. 6

   c. 7

   d. 4

---

4. Consider the below statements and identify the correct answer. **(+1, -0.33)**

   Statement-I: Atomic radius increases in moving from left to right along a period.

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Statement-II: Nuclear charge increases in moving from left to right along a period.

a. Only Statement-I is correct.

b. Only Statement-II is correct.

c. Both statements are correct. Statement-I is the correct explanation of Statement-II.

d. Both statements are correct. Statement-II is the correct explanation of Statement-I.

---

5. Which of the following diseases is NOT sexually transmitted? **(+1, -0.33)**

a. Syphilis

b. Hepatitis B

c. AIDS

d. Tuberculosis

---

6. Which of the following reactions will be considered as a double displacement reaction? **(+1, -0.33)**

a. $Zn + FeCl_2 \rightarrow ZnCl_2 + Fe$

b. $H_2CO_3 \rightarrow CO_2 + H_2O$

c. $HCl + KOH \rightarrow KCl + H_2O$

d. $MgO + H_2O \rightarrow Mg(OH)_2$

---

7. Two resistors, A of 6 Ω and B of 12 Ω, are connected in parallel to a battery of 3 V. The total energy supplied by the battery to the circuit in 1 second is: **(+1, -0.33)**

a. 2.25 J

b. 1.5 J

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c. 4.5 J

d. 7.5 J

---

8. Which of the following is the non-metallic form of a mineral? **(+1, -0.33)**

a. Silver

b. Lead

c. Bauxite

d. Mica

---

9. Which of the following terms will replace the question mark (?) in the given series to make it logically complete? **(+1, -0.33)**

TDK-4, XHO-9, BLS-16, FPW-25, ?

a. JTA-36

b. JTB-36

c. JTA-64

d. JUA-36

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10. In the following diagram, the circle represents girls, the triangle represents science students, and the rectangle represents PG students. The numbers in different sections indicate the number of persons. How many PG students are girls who are NOT science students? **(+1, -0.33)**

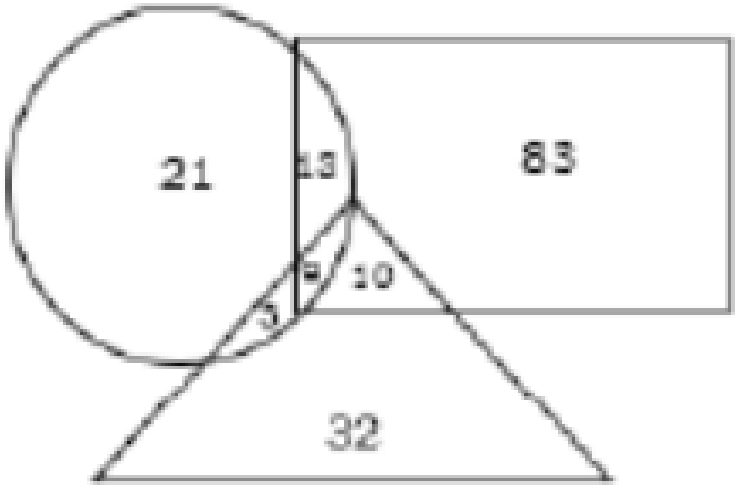
a. 12

b. 2

c. 19

d. 13

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11. Long chain compounds formed by silicon are: **(+1, -0.33)**

a. Less polarizable

b. Very reactive

c. Very stable

d. More ionic

12. A, B, C, D, E, and F live on six different floors of the same building. The lowermost floor is numbered 1, and the topmost is numbered 6. E lives on the floor immediately below F's floor. D lives on the 2nd floor. C lives on the floor immediately below A's floor. F does not live on the 5th floor. On which floor does B live? **(+1, -0.33)**

a. 3rd

b. 1st

c. 5th

d. 6th

13. What approximate value should come in place of the question mark in the following equation? **(+1, -0.33)**

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99.01 ÷ 10.93 + 6.987 × 16.01 = ?

a. 133

b. 145

c. 121

d. 129

---

14. Which of the following groups of three elements each constitutes Dobereiner's triads? **(+1, -0.33)**

a. Ca, Ba, F

b. Li, Mg, Al

c. Cl, H, Si

d. Cl, Br, I

---

15. Bhuvan's salary was first decreased by 16% and subsequently increased by 25%. Find the net percentage change in his salary. **(+1, -0.33)**

a. 10% decrease

b. 5% decrease

c. 5% increase

d. 10% increase

---

16. Who was the first Deputy Chairman of the Planning Commission of India? **(+1, -0.33)**

a. Vallabhbhai Jhaverbhai Patel

b. Gulzarilal Nanda

c. K.C. Neogy

d. Jawaharlal Nehru

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17. Which of the following institutions launched the microfinance movement in India on a pilot basis in 1992? **(+1, -0.33)**

a. IIFCL

b. NABARD

c. SIDBI

d. IFCI

18. Which of the following numbers will replace the question mark (?) in the given series? **(+1, -0.33)**

7, 18, 34, 72, 142, ?

a. 208

b. 282

c. 228

d. 288

19. An object is placed in front of a concave mirror of focal length 12 cm, at a distance of 6 cm. Its image is formed at a distance of: **(+1, -0.33)**

a. 24 cm

b. 48 cm

c. 8 cm

d. 12 cm

20. A and B together can complete a work in 12 days. A alone can complete it in 20 days. If B does the work only for the first half of the day daily, then in how many days will A and B together complete the work? **(+1, -0.33)**

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a. 15 days

b. 22/3 days

c. 43/2 days

d. 40/3 days

---

21. The potential difference across a copper wire is 2.0 V when a current of 0.4 A flows through it. The resistance of the wire is: **(+1, -0.33)**

a. 5 Ω

b. 2 Ω

c. 0.2 Ω

d. 25 Ω

---

22. What will come in the place of the question mark (?) in the following equation if + and - are interchanged, and × and ÷ are interchanged? **(+1, -0.33)**

10 + 152 × 19 - 2 ÷ 3 = ?

a. 4

b. 2

c. 6

d. 8

---

23. A's salary is 20% less than B's salary. By how much percent is B's salary more than A's? **(+1, -0.33)**

a. 17%

b. 20%

c. 25%

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d. 15%

---

24. On 14 February 2022, ISRO (Indian Space Research Organisation) launched which of the following satellites? **(+1, -0.33)**

a. EOS-04

b. EOS-03

c. EOS-01

d. CMS-01

---

25. In the conservation of forests, stakeholders play a very important role. Which of the following are NOT the stakeholders in forests? **(+1, -0.33)**

a. Wildlife and nature enthusiasts

b. The people who live in and around the forest and depend on forest produce

c. Forest Department of the Government

d. People living in urban areas

---

26. It is found that during the dispersion of white light by a glass prism, the more a colour component is bent, the more is the refractive index of the glass for that colour component. If μ_Y, μ_V, μ_G are refractive indices for yellow, violet, and green lights, respectively, then which of the following relations between them is correct? **(+1, -0.33)**

a. $\mu_Y > \mu_V > \mu_G$

b. $\mu_G > \mu_Y > \mu_V$

c. $\mu_Y = \mu_V = \mu_G$

d. $\mu_V > \mu_G > \mu_Y$

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27. Which of the following cities is famous for the iconic 'Kumbh Mela'? (+1, -0.33)

a. Ahmedabad

b. Surat

c. Prayagraj

d. Lucknow

---

28. Some features of villi of the small intestine in humans are given below: (+1, -0.33)

(i) They are finger-like with very thin walls

(ii) Provide a large surface area

(iii) Have small pores for food to pass

(iv) Richly supplied by blood capillaries

Which option shows the features that enable the villi to absorb food?

a. Only (i) and (iii)

b. (i), (ii), and (iv)

c. Only (i)

d. Only (ii) and (iii)

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29. In the given letter-cluster pairs, the first letter-cluster is related to the second letter-cluster following a certain logic. Select the pair that follows the same logic as: (+1, -0.33)

MGB : NTY
THK : GSP

a. LCP : OXJ

b. QDF : TWU

c. MER : NVH

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d. CHX : XIC

---

30. Find the remainder when 171 × 172 × 173 is divided by 17. **(+1, -0.33)**

a. 6

b. 8

c. 7

d. 9

---

31. Which of the following is true? **(+1, -0.33)**

a) Every trapezium is a parallelogram.

b) Every parallelogram is a square.

c) Every rectangle is a square.

d) Every square is a rhombus.

a. Only c

b. Only a

c. Only d

d. Both a and b

---

32. Which institution governs the area that is in transition from rural to urban? **(+1, -0.33)**

a. Gram Panchayat

b. Gram Sabha

c. Panchayat Samiti

d. City Councils

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33. Raghu invests ₹5,00,000 in the name of his daughter, who is 16 years old, in a scheme that pays 5% compound interest per annum, compounded annually. What will be the total amount due to the daughter when she turns 18 years old? **(+1, -0.33)**

a. ₹5,52,150

b. ₹5,51,520

c. ₹5,51,250

d. ₹5,51,250

---

34. Express 0.13241 in the form p/q, where p and q are integers, and q ≠ 0. **(+1, -0.33)**

a. 3807/24975

b. 3287/21780

c. 3337/24160

d. 3307/24975

---

35. Consider the following statements about the magnetic field due to a current-carrying straight conductor: **(+1, -0.33)**

a) The direction of the south pole of a compass needle at a point gives the direction of the magnetic field at that point.

b) The direction of the magnetic field lines gets reversed if the direction of the current in the conductor is reversed.

Which of the above statements is/are correct?

a. Only b

b. Only a

c. Neither a nor b

d. Both a and b

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36. How many such pairs of letters are there in the word HINDUSTAN (in both forward and backward directions) which have as many letters between them in the word as there are in the English alphabetical order? **(+1, -0.33)**

a. 12

b. 3

c. 4

d. 1

37. Who presented a draft bill in the Parliament — The National Anti-Doping Bill, 2021 — to regulate anti-doping activities in sports? **(+1, -0.33)**

a. Sandeep Singh

b. Kiren Rijiju

c. Anurag Thakur

d. Rajyavardhan Singh Rathore

38. Among six students, K, L, M, N, O, and P, each scores different marks in an examination. M scores more marks than only three other students. K scores more marks than N. P scores less marks than M. O scores more marks than L. P scores more marks than K. L scores more marks than M. Who scores the highest marks among all six students? **(+1, -0.33)**

a. K

b. O

c. P

d. N

39. A lens having power 8 D is kept in contact with another lens having power -4 D. The lens combination will act as a: **(+1, -0.33)**

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a. Concave lens having focal length 25 cm

b. Concave lens having focal length 50 cm

c. Convex lens having focal length 25 cm

d. Convex lens having focal length 50 cm

---

40. If each of the digits in the number 63547981 is arranged in ascending order from left to right, then the position of how many digits will remain unchanged as compared to that in the original number? **(+1, -0.33)**

a. Four

b. One

c. Three

d. Two

---

41. Where was the first session of the Indian National Congress held? **(+1, -0.33)**

a. Patna

b. Madras

c. Lucknow

d. Bombay

---

42. What is the process called when a substance's spontaneous movement from a high concentration to a low concentration takes place? **(+1, -0.33)**

a. Gaseous exchange

b. Diffusion

c. Osmosis

d. Circulation

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43. Find the measure of each exterior angle of a regular octagon. **(+1, -0.33)**

a. 120°

b. 60°

c. 45°

d. 135°

---

44. A and B can complete a piece of work in 10 days and 12 days, respectively. If they work on alternate days starting with A, in how many days will the work be completed? **(+1, -0.33)**

a. 10 2/5

b. 10 1/4

c. 10

d. 10 5/6

---

45. Two resistors, A of 10 Ω and B of 30 Ω, are connected in series to a battery of 6 V. The total heat dissipated in the resistors in 1 second is: **(+1, -0.33)**

a. 0.45 J

b. 0.90 J

c. 4.8 J

d. 2.4 J

---

46. If a and b are the roots of the equation $x^2 - 5x - 14 = 0$, then the value of $a^3b^2 + a^2b^3$ is: **(+1, -0.33)**

a. 980

b. 790

c. 670

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d. 840

---

47. In this question, a group of numbers and symbols is coded using letters as per the table given below and the conditions that follow. The correct combination of codes following the conditions is your answer. **(+1, -0.33)**

Number/Symbol	22	56	33	#	46	&	64	@	%	37	57
Code	L	K	J	H	G	F	D	S	A	P	B

Conditions:

1. If the first element is a symbol and the last element is a number, then replace these two (first and last) elements with %.
2. If the second element is a number and the second last is a symbol, the codes of the first and last elements are to be interchanged.
3. If the question has an equal quantity of even and odd numbers, then replace the even numbers with * and odd numbers with <.

Given sequence: #, 22, 64, %, 33, &, 37, @

a. H**A33F37S

b. #LDAJFP@

c. H**A<F<S

d. HLDAJFPS

---

48. Mendel worked with a number of contrasting visible characters of garden pea. Some of them were: **(+1, -0.33)**
a) Round and wrinkled seeds
b) Tall and short plants
c) White and violet flowers
Which of these are the recessive traits in the pea plant?

a. Violet, short, and round

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b. Wrinkled, short, and white

c. Wrinkled, short, and violet

d. Round, short, and white

---

49. If the breadth and height of a closed cuboid are, respectively, 25% and 50% of its length of 12 cm, then find the total surface area of this cuboid. **(+1, -0.33)**

a. 126 cm^2

b. 522 cm^2

c. 252 cm^2

d. 63 cm^2

---

50. What is the name of a river in central India with a total length of about 724 km, which originates from Betul, Madhya Pradesh, and joins the Arabian Sea? **(+1, -0.33)**

a. Tapi River

b. Kaveri River

c. Krishna River

d. Godavari River

---

51. How many such pairs of letters are there in the word TOMORROW (in both forward and backward directions) which have as many letters between them in the word as there are in the English alphabetical order? **(+1, -0.33)**

a. 2

b. 1

c. 4

d. 3

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52. Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number.
6 : 33 :: 11 : 58 :: 18 : ? **(+1, -0.33)**

a. 93

b. 105

c. 108

d. 150

---

53. Among six persons, K, L, M, N, O, and P, each one has a different age. P is older than only three other persons. N is older than L. O is younger than L. M is older than K. P is younger than K. Who is the second youngest among all six persons? **(+1, -0.33)**

a. L

b. O

c. N

d. K

---

54. A dishonest dealer professes to sell his goods at cost price but uses a false weight and thus gains 20%. For a kilogram, he uses a weight of how many grams? **(+1, -0.33)**

a. 785.5 gm

b. 750.5 gm

c. 833.33 gm

d. 708.06 gm

---

55. A 3-digit number is such that the unit digit, tens digit, and hundreds digit are in the ratio 1 : 2 : 3. The sum of this number and its reversed number is 1332. Find the number. **(+1, -0.33)**

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a. 414

b. 246

c. 123

d. 369

---

56. All of the statements given below regarding inhalation in humans are correct except one. Which one is NOT correct? **(+1, -0.33)**

a) Ribs move inward and diaphragm is raised.
b) Ribs are lifted up and diaphragm becomes flar.
c) Chest cavity becomes larger.
d) Air is sucked into the lungs.

a. b

b. d

c. a

d. c

---

57. Find the surface area of a sphere with a diameter of 1/2 cm. **(+1, -0.33)**

a. $\pi / 4$ cm²

b. $\pi / 2$ cm²

c. π^2 cm²

d. $2\pi^2$ cm²

---

58. The following table shows the population of six different cities, A, B, C, D, E, and F, the ratio of males to females among them, and the ratio of adults to children in the total population. Study the table and answer the question. **(+1, -0.33)**

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City	Population	Male : Female	Adult : Children
A	410400	13 : 11	5 : 3
B	369900	5 : 4	7 : 2
C	442800	5 : 7	7 : 5
D	465500	17 : 18	4 : 3
E	499500	5 : 4	5 : 4
F	424500	8 : 7	17 : 13

What is the difference between the total number of adults and the total number of children in city A?

a. 1,04,600

b. 1,02,600

c. 1,02,000

d. 1,12,600

---

59. If $x = 2 + \sqrt{5}$ and $y = 2 - \sqrt{5}$, then the value of $x^2 + y^2$ is: **(+1, -0.33)**

a. 18

b. 16

c. 20

d. 22

---

60. Books that contain the records of Christ's life are known as_____. **(+1, -0.33)**

a. Gospels

b. Torahs

c. Sermons

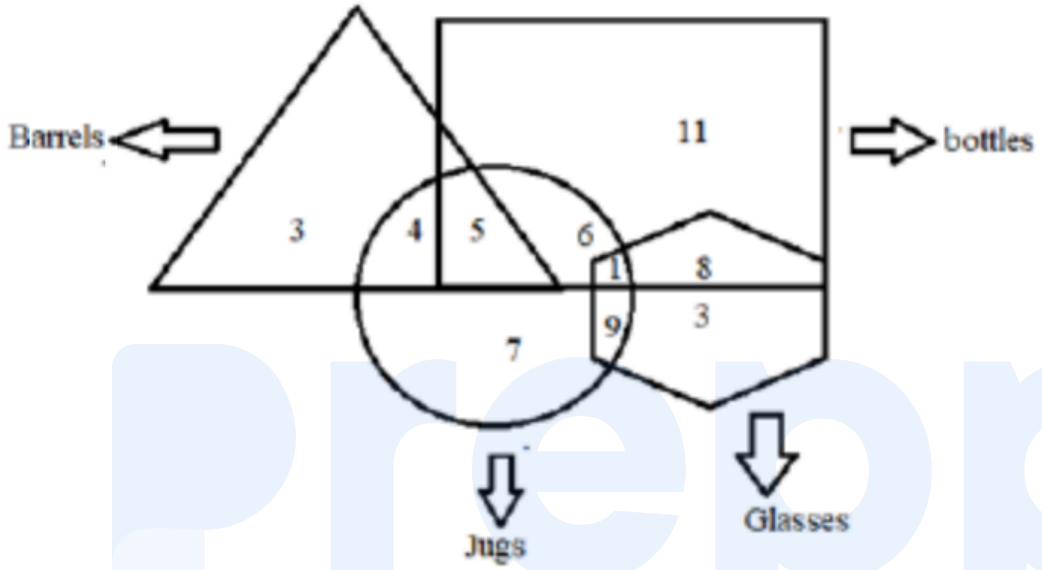
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d. Psalms

---

61. Study the given diagram carefully and answer the question. The numbers in different sections indicate the number of articles. **(+1, -0.33)**

How many such barrels are there that are only jugs?



a. 5

b. 2

c. 4

d. 6

---

62. Select the option that is related to the fifth number in the same way as the second number is related to the first number and the fourth number is related to the third number. **(+1, -0.33)**

18 : 63 :: 44 : 154 :: 54 : ?

a. 146

b. 138

c. 189

d. 179

---

63. Where in the human body does pyruvate undergo aerobic breakdown? **(+1, -0.33)**

a. Nucleus

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b. Mitochondria

c. Cytoplasm

d. Muscles

---

64. For a given data, if mean and mode are 42 and 60, respectively, then find the median of the data using empirical relation. **(+1, -0.33)**

a. 50

b. 44

c. 46

d. 48

---

65. The first step to practice waste management is segregation. Select the INCORRECT option with regard to segregation of waste into different categories. **(+1, -0.33)**

a. It helps to identify materials that can be sold to earn revenue.

b. It prevents items suitable for recycling from being thrown away.

c. It increases the amount of waste going into landfills.

d. Segregation helps to reduce the money spent on disposal of waste.

---

66. Eight students 1 to 8 are sitting around a circular table facing the center. 1 is the immediate neighbor of both 8 and 2. 3 is sitting second to the right of 1. 1 is sitting second to the right of 7. 5 is the immediate neighbor of 6 and 4. How many students were sitting between 5 and 1? **(+1, -0.33)**

a. One

b. None

c. Two

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d. Three

---

67. According to Article 24 of the Constitution of India, which deals with the Right against Exploitation, what is the minimum age fixed by the government to work in a factory or mine? **(+1, -0.33)**

a. 14 years

b. 16 years

c. 18 years

d. 21 years

---

68. Refer to the following letter, number, and symbol series and answer the question: **(+1, -0.33)**
(Left) G B D F H & 8 * T % 7 D 4 @ 6 K & 2 R P Q T @ Y # 3 5 E * S (Right)
How many such symbols are there in the series which are immediately preceded by a letter and also immediately followed by a number?

a. One

b. Four

c. Three

d. Two

---

69. 'Families increase savings to offset the increased government dissaving'. **(+1, -0.33)**
Who among the following has given this theory?

a. B.R. Ambedkar

b. Takeshi Amemiya

c. Walter Adams

d. David Ricardo

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70. India's first wholly owned women's industrial park opened in March 2022 in Hyderabad. This park has been promoted by which organization in collaboration with the Government of Telangana? **(+1, -0.33)**

a. Confederation of Women Entrepreneurs

b. Self Employed Women's Association

c. FICCI Ladies Organisation

d. Sabala Organisation

---

71. The sum of the prime factors of $9^6 \times 12^4 \times 7^7$ is: **(+1, -0.33)**

a. 13

b. 12

c. 11

d. 14

---

72. If $x^3 - 3x + 6 = 0$, then it is: **(+1, -0.33)**

a. a quadratic equation

b. a linear equation

c. a quadratic expression

d. not a quadratic equation

---

73. Which of the following types of coal is known to have the highest carbon content in it? **(+1, -0.33)**

a. Bituminous

b. Lignite

c. Sub-bituminous

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d. Anthracite

---

74. The sum of the ages of five children born at intervals of three years each is 60 years. What is the age of the youngest child? **(+1, -0.33)**

a. 4 years

b. 7 years

c. 5 years

d. 6 years

---

75. A retailer would have made a profit of 18 percent if he sold an article at its marked price. He allowed a discount of 10 percent on the marked price. What would his actual profit on that article have been? **(+1, -0.33)**

a. 4.6 percent

b. 7.1 percent

c. 6.2 percent

d. 5.5 percent

---

76. Hisar is to the north of Bhivani, Bhivani is to the west of New Delhi, Rohtak is to the south of Panipat and to the east of New Delhi. What is the position of Hisar with respect to Panipat? **(+1, -0.33)**

a. North

b. South

c. East

d. West

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77. Ramya got married 10 years ago. Now her age is $1^{1/5}$ times her age at the time of marriage. Her daughter's age is one-tenth of her present age. Find her daughter's present age. **(+1, -0.33)**

a. 12 years

b. 20 years

c. 6 years

d. 8 years

---

78. Consider the following statements about the magnetic field due to a current-carrying solenoid: **(+1, -0.33)**
a) The magnetic field is uniform inside the solenoid.
b) One end of the solenoid behaves like the north pole and the other like the south pole of a bar magnet.
Which of the above statements is/are correct?

a. Both (a) and (b)

b. Only (a)

c. Neither (a) nor (b)

d. Only (b)

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79. The following bar graph gives the information on the number of students who appeared, qualified, and failed in a bank PO exam (in hundreds) in different years. Study the graph and answer the question. **(+1, -0.33)**
By what percentage is the average number of students who failed in the given five years more than the number of students who failed in 2017?

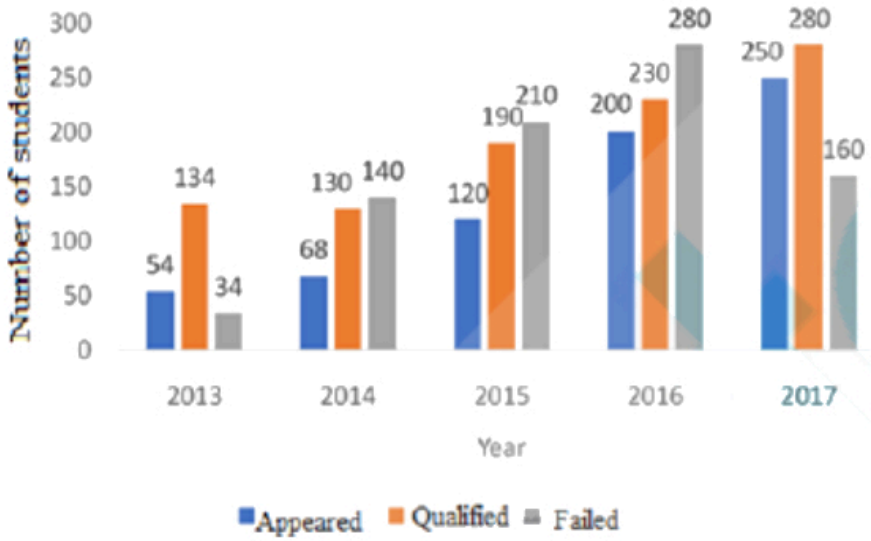
a. 3%

b. 2%

c. 4%

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d. 5%



---

80. Nirmal and Sushma are standing in a queue of people facing north. Nirmal is at the 20th position from the extreme left end, and Sushma is at the 10th position from the extreme right end. The positions of Nirmal and Sushma are interchanged due to some criteria based on age. If the new position of Nirmal is 30th from the extreme left end, then what is the new position of Sushma from the extreme right end? **(+1, -0.33)**

a. 25th

b. 30th

c. 18th

d. 20th

---

81. A concave mirror converges light rays from the sun at 10 cm from the mirror. If an object is placed 20 cm from the mirror, the image is formed: **(+1, -0.33)**

a. 20 cm in front of the mirror

b. 20 cm behind the mirror

c. 10 cm in front of the mirror

d. 10 cm behind the mirror

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82. Silver chloride decomposes into silver and chlorine gas in the presence of ultraviolet radiation. This is an example of: **(+1, -0.33)**

a. Photolytic decomposition reaction

b. Double displacement reaction

c. Thermal decomposition reaction

d. Redox reaction

---

83. The value of: **(+1, -0.33)**

$2-\frac{\sin^2\alpha}{1-\cos\alpha}+\frac{1-\cos\alpha}{\sin\alpha}-\frac{\sin\alpha}{1+\cos\alpha}$

a. 1 - sin α

b. 1 + sin α

c. 1 + cos α

d. 1 - cos α

---

84. Nine people, numbered 1 to 9, are sitting in a straight row facing north. 8 is sitting in the middle of the row, with 5 and 1 as immediate neighbors. 9 is at one of the extreme ends, with 2 as an immediate neighbor. Only five people are between 2 and 3. 3 is between 7 and 6. 1 and 7 are immediate neighbors. How many people are there between 4 and 6? **(+1, -0.33)**

a. Four

b. Two

c. Five

d. One

---

85. Which of the following numbers will replace the question mark (?) in the given series? **(+1, -0.33)**
3, 9, 25, 53, 157, ?

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a. 371

b. 317

c. 307

d. 300

---

86. Formation of methyl chloride from methane and chlorine gas is which type of reaction? (+1, -0.33)

a. Oxidation reaction

b. Addition reaction

c. Substitution reaction

d. Combustion reaction

---

87. At what time between 2 o'clock and 3 o'clock will the hands of a clock be together? (+1, -0.33)

a. 10 $^{10/11}$ past 2

b. 11$^{12/11}$ past 2

c. 6 $^{5/11}$ past 2

d. 3 $^{5/11}$ past 2

---

88. In September 2021, which state government launched the Nirbhaya Ek Pahal scheme under Phase 3 of Mission Shakti? (+1, -0.33)

a. Rajasthan

b. Goa

c. Uttar Pradesh

d. Chhattisgarh

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89. The Secretary General of the Rajya Sabha is appointed by who among the following? **(+1, -0.33)**

a. Attorney General

b. Prime Minister

c. Chairman of Rajya Sabha

d. President

90. As a part of the policy to promote "Sports for Unity," National Games Gujarat 2022 is proposed to have a total of how many sports? **(+1, -0.33)**

a. 28

b. 36

c. 30

d. 32

91. Given below are three statements and three conclusions. Take the statements to be true even if they are at variance with commonly known facts, and decide whether the conclusions follow the given statements. **(+1, -0.33)**

Statements:

1. All pen drives are hard drives.
2. Some hard drives are chips.
3. All chips are keyboards.

Conclusions:

1. Some keyboards are pen drives.
2. Some chips are pen drives.
3. Some keyboards are hard drives.

a. Conclusions I and III follow

b. Only conclusion I follows

c. All the conclusions follow

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d. Only conclusion III follows

---

92. Which of the following statements about Classical Language is INCORRECT? **(+1, -0.33)**

a. The classical language and literature being distinct from modern is necessary for a language to be classical.

b. At least two million people must speak the language for it to be considered classical.

c. High antiquity of a language's early texts over a period of 1500-2000 years is necessary for it to be considered classical.

d. The literary tradition must be original and not borrowed from another speech community for a language to be classical.

---

93. If average production is decreasing, then what will be the effect on marginal production? **(+1, -0.33)**

a. It will have a positive slope

b. It will be more than average production

c. It will be less than average production

d. It will be the same as average production

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94. In this question, a group of numbers or symbols is coded using letters as per the table given below and the conditions that follow. The correct combination of codes following the conditions is your answer. **(+1, -0.33)**

Number / Symbol	4	α	5	9	÷	±	8	$	!	3	@	6	7	2
Code	C	G	K	Q	W	R	T	V	X	D	A	E	H	G

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Conditions:

(i) If the first element is a number and the last is a symbol, the codes for these two (first and last elements) are to be interchanged.

(ii) If the first element is an EVEN number and the last, an ODD number, the first and last elements are to be coded as !.

(iii) If both the third and the fourth elements are prime numbers, the fourth element is to be coded as the code for the third element and vice-versa.

Question: 8 $ 5 2 @

a. TVKGA

b. TVGKA

c. AVGKT

d. AVGKT

---

95. Simplify $6^2 + 3^2 + 2^4$. **(+1, -0.33)**

a. 61

b. 52

c. 45

d. 63

---

96. Q started from a point and walked towards the south for 42 meters and reached point A. Q then turned right from point A and walked 2 meters, then turned right again and walked 30 meters. Q turned left and walked 10 meters, then turned left again and walked 30 meters. How far is Q from point A? **(+1, -0.33)**

a. 52 meters

b. 12 meters

c. 42 meters

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d. 30 meters

---

97. In a college, different rooms are located on different floors: Art room, Library, Gym, Labs, Storerooms, Staffrooms, and Classrooms. The lowermost floor is numbered 1, and the topmost is numbered 7. The Library is immediately below the Gym. Only two floors exist between the Gym and the Classrooms. The Labs and Staffrooms are on even-numbered floors. Three floors separate the Storerooms and Art room. The Storerooms are immediately below the Labs. Which of the following is located on floor number 4? **(+1, -0.33)**

a. Storerooms

b. Staffrooms

c. Art room

d. Labs

---

98. Solve: $3(5x^2 - 7) - 5(3x^2 + 2x - 7) = -16$ **(+1, -0.33)**

a. 2

b. 3

c. 4

d. 5

---

99. A statement is given, followed by two arguments. Read the statement and arguments carefully and select the appropriate answer. **(+1, -0.33)**

Statement: Students have complained that questions outside the prescribed syllabus were asked in the X standard board exams this year.

Arguments:

I: The pass percentage in the X standard board exams has declined by 5 percent this year.

II: The number of students scoring over 60 percent in the X standard board exams has increased by 15 percent this year.

a. Both arguments I and II weaken the statement

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b. Argument II weakens, while argument I strengthens the statement

c. Both arguments I and II strengthen the statement

d. Argument I weakens, while argument II strengthens the statement

---

100. From which of the following countries has the Freedom of Trade feature been taken in the Indian Constitution? **(+1, -0.33)**

a. USSR

b. Germany

c. Ireland

d. Australia

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Answers

1. **Answer: b**

Explanation:

Detailed Solution:

Salts of a strong acid and a strong base (e.g., NaCl) are neutral because both components fully dissociate in water, resulting in a pH of 7. Meanwhile, salts of a strong acid and a weak base (e.g., NH_4Cl) are acidic because the weak base's conjugate acid hydrolyzes, decreasing the pH to below 7.

---

2. **Answer: d**

Explanation:

Detailed Solution:

Baking soda (sodium bicarbonate, $NaHCO_3$) is manufactured using common salt (NaCl), carbon dioxide (CO_2), and ammonia (NH_3) in the Solvay process. This process involves the reaction of NaCl and NH_3 with CO_2 and water to produce $NaHCO_3$.

---

3. **Answer: a**

Explanation:

Detailed Solution:

Step 1: Use the formula for mean.

Mean equals sum of all values divided by total number of values.

Step 2: Write the equation.

$(22.5 + 56 + 42.5 + (2x + 1) + (x - 2) + 3x + 36) \div 7 = 30$

Step 3: Simplify and solve for x: $x = 9$.

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4. **Answer: b**

Explanation:

Detailed Solution:

Step 1: Analyze Statement I. Atomic radius decreases from left to right in a period due to increased nuclear charge pulling electrons closer. Thus, Statement I is incorrect.

Step 2: Analyze Statement II. Nuclear charge increases across a period due to an increasing number of protons. Thus, Statement II is correct.

---

5. **Answer: d**

Explanation:

Detailed Solution:

Tuberculosis is a respiratory disease caused by *Mycobacterium tuberculosis*. It spreads through airborne droplets, not sexual contact.

Incorrect Options:

Option 1: Syphilis is sexually transmitted.

Option 2: Hepatitis B can be transmitted through bodily fluids, including sexual contact.

Option 3: AIDS, caused by HIV, is sexually transmitted.

---

6. **Answer: c**

Explanation:

Detailed Solution:

A double displacement reaction involves the exchange of ions between two compounds. In the reaction $HCl + KOH \rightarrow KCl + H_2O$, H^+ from HCl combines with OH^- from KOH to form water, and K^+ combines with Cl^- to form KCl.

Incorrect Options:

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Option 1: This is a single displacement reaction where Zn replaces Fe.

Option 2: This is a decomposition reaction, not a double displacement reaction.

Option 4: This is a combination reaction, as MgO reacts with H_2O to form $Mg(OH)_2$.

---

7. **Answer: a**

Explanation:

Detailed Solution:

Step 1: Calculate the equivalent resistance.

For resistors in parallel, the formula is:

$1/R_{eq} = 1/R_1 + 1/R_2$

$1/R_{eq} = 1/6 + 1/12$

$R_{eq} = 4\ \Omega$

Step 2: Calculate the total power supplied by the battery.

Power $P = V^2 / R$

$P = 3^2 / 4$

$P = 9 / 4$

$P = 2.25$ W

Step 3: Calculate the total energy supplied in one second.

Energy E = Power × Time

$E = 2.25 \times 1$

$E = 2.25$ J

---

8. **Answer: d**

Explanation:

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Detailed Solution:

Mica is a non-metallic mineral that is used in electrical and thermal insulation due to its unique properties.

Incorrect Options:

Option 1: Silver is a metallic mineral.

Option 2: Lead is also a metallic mineral.

Option 3: Bauxite is an ore of aluminum, which is extracted as a metal.

---

9. **Answer: a**

Explanation:

Detailed Solution:

The series follows a pattern of increasing alphabet shifts and square numbers. The numeric value increases as the square of consecutive integers: $2^2 = 4$, $3^2 = 9$, $4^2 = 16$, $5^2 = 25$, and $6^2 = 36$.

The correct term is JTA-36.

Incorrect Options:

Options 2, 3, and 4: Do not follow the logical pattern of the series.

---

10. **Answer: d**

Explanation:

Detailed Solution:

The required section is where the circle (girls) and rectangle (PG students) overlap, excluding the triangle (science students). From the diagram, this number is 13.

Incorrect Options:

Option 1: Refers to a different subset of the diagram.

Option 2: Represents an incorrect part of the diagram.

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Option 3: Includes students who are not relevant to the question.

---

11. **Answer: b**

Explanation:

Detailed Solution:

Silicon-based long-chain compounds, such as silicones, exhibit reactivity depending on the functional groups attached. Although silicones are stable in some environments, they can be reactive due to their exposed Si atoms, making "Very reactive" the correct choice.

Incorrect Options:

Option 1: Silicon's compounds are moderately polarizable, but this property does not define long chains specifically.

Option 3: While some silicon compounds are stable, the question emphasizes reactivity.

Option 4: Long-chain compounds of silicon are covalent, not ionic.

---

12. **Answer: b**

Explanation:

Detailed Solution:

Based on the given conditions:

- D is on the 2nd floor.
- E is immediately below F, so F must be on the 3rd floor and E on the 2nd floor.
- C is immediately below A, so A must be on the 5th floor and C on the 4th floor.
- B must be on the remaining floor, which is the 1st floor.

Incorrect Options:

Option 1, 3, and 4: Do not align with the floor allocations based on the conditions.

---

13. **Answer: c**

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Explanation:

Detailed Solution:

Step 1: Approximate the given values.

99.01 is approximately 99

10.93 is approximately 11

6.987 is approximately 7

16.01 is approximately 16

Step 2: Perform the multiplication.

7 times 16 equals 112

Step 3: Add all the terms.

99 plus 11 plus 112 equals 121

Thus, the correct answer is 121.

---

14. **Answer: d**

Explanation:

Detailed Solution:

Dobereiner's triads are groups of three elements with similar chemical properties, where the atomic weight of the middle element is approximately the average of the other two.

For Cl (35.5), Br (80), and I (127), this relationship holds:

Average of Cl and I equals open parenthesis 35.5 plus 127 close parenthesis divided by 2

Average equals 81.25 which is approximately 80

Thus, Cl, Br, and I form a valid Dobereiner's triad.

---

15. **Answer: c**

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Explanation:

Detailed Solution:

Let the initial salary be 100.

Step 1: Apply a 16 percent decrease.

New salary equals 100 minus open parenthesis 16 percent of 100 close parenthesis

New salary equals 100 minus 16 equals 84

Step 2: Apply a 25 percent increase on 84.

New salary equals 84 plus open parenthesis 25 percent of 84 close parenthesis

New salary equals 84 plus 21 equals 105

Step 3: Calculate the net percentage change.

Net change equals 105 minus 100

Net percentage change equals 5 percent increase

---

16. **Answer: b**

Explanation:

Detailed Solution:

The first Deputy Chairman of the Planning Commission of India was Gulzarilal Nanda. He served from 1950 to 1951 and played a key role in shaping India's economic planning under the First Five-Year Plan.

Incorrect Options:

Option 1: Vallabhbhai Patel was India's first Deputy Prime Minister, not associated with this role.

Option 3: K.C. Neogy did not serve as the Deputy Chairman of the Planning Commission.

Option 4: Jawaharlal Nehru was the first Chairman of the Planning Commission, not the Deputy Chairman.

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17. **Answer: b**

Explanation:

Detailed Solution:

NABARD (National Bank for Agriculture and Rural Development) launched the microfinance movement in India in 1992. This was achieved through the SHG-Bank Linkage Program, which connected self-help groups to banks to facilitate financial inclusion.

Incorrect Options:

Option 1: IIFCL focuses on infrastructure financing, not microfinance.

Option 3: SIDBI supports small industries but was not the pioneer of microfinance in 1992.

Option 4: IFCI primarily funds industrial projects, not rural microfinance initiatives.

---

18. **Answer: d**

Explanation:

Detailed Solution:

The pattern in the series is as follows:

Difference between consecutive terms:

- 18 - 7 = 11
- 34 - 18 = 16
- 72 - 34 = 38
- 142 - 72 = 70
- The next difference should be 146

Next term = 142 + 146 = 288

---

19. **Answer: a**

Explanation:

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Detailed Solution:

Using the mirror formula:

$1/f = 1/v + 1/u$

Here, $f = -12$ cm (concave mirror) and $u = -6$ cm (object distance):

$1/(-12) = 1/v - 1/(-6)$

$1/v = 1/(-12) + 1/6 = (-1 + 2)/12 = 1/12$

$v = 12$ cm

The image is formed 24 cm in front of the mirror.

Incorrect Options:

Options 2, 3, and 4 are incorrect based on improper application of the mirror formula.

---

20. **Answer: a**

Explanation:

Detailed Solution:

Work done per day by A and B together:

Rate of A = 1/20, Rate of A + B = 1/12

Rate of B = 1/12 - 1/20 = (5 - 3)/60 = 2/60 = 1/30

If B works only for half a day, their effective rate is:

Effective rate of B = 1/2 × 1/30 = 1/60

Combined rate = 1/20 + 1/60 = (3 + 1)/60 = 4/60 = 1/15

Time required = 1 ÷ Combined rate = 15 days

---

21. **Answer: a**

Explanation:

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Detailed Solution:

Using Ohm's law:

$V = I \times R$

Rearranging for R:

$R = V \div I$

Substitute V = 2.0 V and I = 0.4 A:

$R = 2.0 \div 0.4 = 5\ \Omega$

Incorrect Options:

Options 2, 3, and 4 result from incorrect substitution or application of Ohm's law.

---

22. Answer: d

Explanation:

Detailed Solution:

Step 1: Identify the given equation.

10 plus 152 times 19 minus 2 divided by 3

Step 2: Apply the given interchange rules.

- Plus and minus are interchanged.
- Times and divide are interchanged.

Modified equation:

10 minus 152 divided by 19 plus 2 times 3

Step 3: Solve the modified equation.

$152 \div 19 = 8$

$2 \times 3 = 6$

10 minus 8 plus 6

2 plus 6 = 8

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Thus, the correct answer is 8.

---

23. **Answer: c**

Explanation:

Detailed Solution:

Let B's salary be 100. Then A's salary is:

100 - 20% of 100 = 80

The percentage by which B's salary is more than A's:

(100 - 80) ÷ 80 × 100 = 25%

So, B's salary is 25% more than A's.

---

24. **Answer: a**

Explanation:

Detailed Solution:

ISRO launched the Earth Observation Satellite (EOS-04) on 14 February 2022. This satellite provides high-quality imagery for agriculture, forestry, and disaster management.

Incorrect Options:

Options 2, 3, and 4 refer to other satellites launched on different dates.

---

25. **Answer: d**

Explanation:

Detailed Solution:

People living in urban areas are not direct stakeholders in forests because they do not rely on forest produce or play an active role in forest conservation.

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Incorrect Options:

Options 1, 2, and 3 are all stakeholders as they directly or indirectly depend on forests or contribute to their preservation.

---

26. Answer: d

Explanation:

Detailed Solution:

During the dispersion of white light by a prism:

Violet light bends the most and has the highest refractive index (μ_V). Green light bends less than violet but more than yellow, and yellow light bends the least, having the lowest refractive index (μ_Y).

The correct relationship is:

$\mu_V > \mu_G > \mu_Y$

Incorrect Options:

Option 1: $\mu_y > \mu_v > \mu_g$ is incorrect because yellow has the lowest refractive index.

Option 2: $\mu_g > \mu_y > \mu_v$ is incorrect because violet has the highest refractive index.

Option 3: $\mu_y = \mu_v = \mu_g$ is incorrect because different colours have different refractive indices.

---

27. Answer: c

Explanation:

Detailed Solution:

The Kumbh Mela is a significant Hindu festival and pilgrimage held in four locations: Prayagraj (Allahabad), Haridwar, Nashik, and Ujjain. Prayagraj is one of the primary and most iconic sites for this event.

Incorrect Options:

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Options 1, 2, and 4 are not associated with the Kumbh Mela.

---

28. **Answer: b**

Explanation:

Detailed Solution:

The features that enable villi to absorb food effectively are:

- (i) Thin walls for easy diffusion of nutrients
- (ii) Large surface area to maximize absorption
- (iv) Rich blood supply to transport absorbed nutrients

Incorrect Options:

Options 1, 3, and 4 omit essential features for absorption, such as surface area and blood supply.

---

29. **Answer: b**

Explanation:

Detailed Solution:

The logic for MGB : NTY and THK : GSP is as follows:

MGB : NTY

- M → N: Shift forward by 1 position
- G → T: Shift forward by 13 positions
- B → Y: Shift forward by 23 positions

THK : GSP

- T → G: Shift forward by 13 positions
- H → S: Shift forward by 13 positions
- K → P: Shift forward by 5 positions

The logic involves shifting by specific positions, varying for each letter.

Now apply the same logic to the options:

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Option 2: QDF : TWU

- Q → T: Shift forward by 3 positions
- D → W: Shift forward by 19 positions
- F → U: Shift forward by 15 positions

This matches the shifting pattern used in the question, making Option 2 the correct answer.

Incorrect Options:

Option 1: LCP : OXJ does not follow the same shifting logic.

Option 3: MER : NVH does not follow the same shifting pattern.

Option 4: CHX : XIC does not match the logic used in the question.

---

30. **Answer: a**

Explanation:

Detailed Solution:

Using modular arithmetic, simplify each term modulo 17:

171 mod 17 = 171 ÷ 17 = 10 remainder 1

So, 171 ≡ 1 mod 17

172 mod 17 = 172 ÷ 17 = 10 remainder 2

So, 172 ≡ 2 mod 17

173 mod 17 = 173 ÷ 17 = 10 remainder 3

So, 173 ≡ 3 mod 17

Now calculate the product:

(171 × 172 × 173) mod 17 ≡ (1 × 2 × 3) mod 17

1 × 2 = 2

2 × 3 = 6

So, the remainder is 6.

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Incorrect Options:

Option 2: 8 is incorrect because it results from a miscalculation.

Option 3: 7 is incorrect as it does not match the modular arithmetic result.

Option 4: 9 is unrelated to the calculation.

---

31. Answer: c

Explanation:

Detailed Solution:

d) Every square is a rhombus is true because a square has all the properties of a rhombus, including equal sides and diagonals bisecting at right angles.

Incorrect Options:

Option 1: c) Every rectangle is a square is incorrect because rectangles can have unequal adjacent sides.

Option 2: a) Every trapezium is a parallelogram is incorrect as trapeziums have only one pair of parallel sides, while parallelograms have two pairs.

Option 4: Both a and b are incorrect as discussed.

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---

32. Answer: d

Explanation:

Detailed Solution:

City Councils govern areas transitioning from rural to urban, as they handle urban development and administrative needs during this transition.

Incorrect Options:

Options 1, 2, and 3 are incorrect because Gram Panchayat, Gram Sabha, and Panchayat Samiti deal with rural areas, not transitioning or urban areas.

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33. **Answer: d**

Explanation:

Detailed Solution:

Using the compound interest formula: $A = P \times (1 + r/100)^t$

Here, P = 5,00,000, r = 5%, and t = 2

$A = 5,00,000 \times (1 + 5/100)^2$

$A = 5,00,000 \times (1.05)^2$

$A = 5,00,000 \times 1.1025$

A = ₹5,51,250

The amount due to the daughter is ₹5,51,250

Incorrect Options:

Options 1, 2, and 3 result from incorrect calculations of compound interest.

---

34. **Answer: d**

Explanation:

Detailed Solution:

To express 0.13241 in fractional form:

Let x equal 0.13241

Multiply by 100000 to remove the decimal:

100000x equals 13241

Then:

x equals 13241 over 100000

Simplify the fraction by dividing numerator and denominator by their GCD (25):

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13241 over 100000 equals 3307 over 24975

The correct fraction is 3307 over 24975

Incorrect Options:

Options 1, 2, and 3 are incorrect because they result from incorrect simplification or calculations.

---

35. **Answer: a**

Explanation:

Detailed Solution:

Statement b is correct because the magnetic field lines around a current-carrying conductor depend on the direction of the current, as per the right-hand thumb rule. Reversing the current reverses the field direction.

Statement a is incorrect because the direction of the north pole of a compass needle, not the south pole, indicates the magnetic field direction.

Incorrect Options:

Option 2: Only a is incorrect as it misinterprets the compass needle's behavior.

Option 3: Neither a nor b is incorrect since b is correct.

Option 4: Both a and b is incorrect because a is false.

---

36. **Answer: b**

Explanation:

The correct answer is "3." The pairs that satisfy the condition are H-N, I-N, and D-S.

---

37. **Answer: c**

Explanation:

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The correct answer is "Anurag Thakur." He presented the National Anti-Doping Bill, 2021 to regulate anti-doping activities in India.

---

38. Answer: b

Explanation:

The correct answer is "O." The ranking of students based on the given conditions is O > L > P > K > M > N, making O the highest scorer.

---

39. Answer: c

Explanation:

The correct answer is "Convex lens having focal length 25 cm." The combined power of the lenses is calculated as 4 D, which gives a focal length of 25 cm.

---

40. Answer: d

Explanation:

The correct answer is "Two." After arranging the digits in ascending order, the digits 3 and 5 remain in their original positions.

---

41. Answer: d

Explanation:

The correct answer is "Bombay." The first session of the Indian National Congress was held in Bombay (now Mumbai) in December 1885, under the presidency of W.C. Bonnerjee.

---

42. Answer: b

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Explanation:

The correct answer is "Diffusion." Diffusion is the spontaneous movement of molecules or particles from an area of high concentration to an area of low concentration without requiring energy.

---

43. Answer: c

Explanation:

The correct answer is "45°." The formula for the exterior angle of a regular polygon is 360° ÷ number of sides. For a regular octagon (8 sides), the exterior angle is 360° ÷ 8 = 45°.

---

44. Answer: d

Explanation:

The correct answer is "10 5/6." A's 1 day work = 1/10, B's 1 day work = 1/12. Work done in 2 days (A + B) = 11/60. The total time is calculated using work completed in cycles and remaining work after full cycles.

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45. Answer: b

Explanation:

The correct answer is "0.90 J." The total resistance in the circuit is 40 Ω, and the current flowing is 0.15 A. Using the formula $H = I^2 \times R \times t$, the heat dissipated is 0.90 J.

---

46. Answer: a

Explanation:

Detailed Solution:

We are given the quadratic equation $x^2 - 5x - 14 = 0$, and its roots are a and b.

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By Vieta's formulas:

Sum of roots, $a + b = 5$

Product of roots, $ab = -14$

We need to calculate $a^3b^2 + a^2b^3$, which can be rewritten as:

$a^3b^2 + a^2b^3 = ab(a^2b + ab^2)$

Step 1: Simplify $a^2b + ab^2$:

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

Step 2: Substitute the values of $a + b$ and ab:

$a^2b + ab^2 = (-14)(5) = -70$

Step 3: Substitute into the original expression:

$a^3b^2 + a^2b^3 = ab(a^2b + ab^2)$

$a^3b^2 + a^2b^3 = (-14)(-70) = 980$

The value of $a^3b^2 + a^2b^3$ is 980.

Incorrect Options:

Options 1, 3, and 4 are incorrect because they miscount or misunderstand the criteria for letter pairs.

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---

47. Answer: c

Explanation:

The given sequence is #, 22, 64, %, 33, &, 37, @. Let us check the conditions step by step:

- **Condition 1:** The first element is # (a symbol), and the last element is @ (a symbol), so this condition does not apply.
- **Condition 2:** The second element (22) is a number, and the second last element (37) is not a symbol, so this condition does not apply.
- **Condition 3:** There are equal even and odd numbers in the sequence:

Even numbers: 22, 64

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Odd numbers: 33, 37

Since there are equal even and odd numbers, replace even numbers (22, 64) with * and odd numbers (33, 37) with <.

The new sequence becomes: F ** A P < S < I

Final Answer: H**A<F<S (Option 3)

---

48. Answer: b

Explanation:

Detailed Solution:

In Mendel's pea plant experiments, the recessive traits were:

- Wrinkled seeds (dominant trait is round)
- Short plants (dominant trait is tall)
- White flowers (dominant trait is violet)

Thus, the correct answer is "Wrinkled, short, and white".

Incorrect Options:

Options 1, 3, and 4 contain incorrect recessive traits.

---

49. Answer: c

Explanation:

Detailed Solution:

Given:

- Length (L) = 12 cm
- Breadth (B) = 25% of 12 = 3 cm
- Height (H) = 50% of 12 = 6 cm

Total surface area of a cuboid is given by:

Surface Area = 2(LB + BH + HL)

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Surface Area = 2(12 × 3 + 3 × 6 + 6 × 12)

Surface Area = 2(36 + 18 + 72)

Surface Area = 2 × 126

Surface Area = 252 cm²

Incorrect Options:

Options 1, 2, and 4 result from miscalculations in applying the surface area formula.

---

50. Answer: a

Explanation:

Detailed Solution:

The Tapi River originates from Betul district in Madhya Pradesh and flows westward, joining the Arabian Sea. It has a total length of approximately 724 km.

Incorrect Options:

Option 2: Kaveri River flows through Karnataka and Tamil Nadu and drains into the Bay of Bengal.

Option 3: Krishna River originates in Maharashtra and flows into the Bay of Bengal.

Option 4: Godavari River also drains into the Bay of Bengal, not the Arabian Sea.

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---

51. Answer: b

Explanation:

The correct answer is "1." The pairs satisfying the condition are T-O and O-R in both forward and backward directions. They match the spacing in the English alphabetical order.

---

52. Answer: a

Explanation:

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The pattern involves multiplying the first number by 5 and adding 3.

So, 18 × 5 + 3 = 93.

Hence, the correct answer is 93.

---

53. Answer: a

Explanation:

The correct answer is "L." After analyzing the conditions, the ranking of the ages shows that L is the second youngest person.

---

54. Answer: c

Explanation:

The correct answer is "833.33 gm." The effective weight is calculated using the formula (1000 × 100) ÷ 120 = 833.33 gm, considering a 20% gain in weight.

---

55. Answer: d

Explanation:

The correct answer is "369." The digits are in the ratio 1:2:3, so the number is 369, and its reverse is 963. The sum of 369 and 963 is 1332.

---

56. Answer: c

Explanation:

Detailed Solution:

During inhalation, the ribs are lifted upward, and the diaphragm contracts and moves downward to increase the chest cavity, allowing air to enter the lungs.

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Incorrect Options:

Option 1: Ribs do not move inward during inhalation; they expand.

Option 2: The diaphragm flattens during inhalation, which is correct.

Option 4: Air is indeed sucked into the lungs during inhalation.

---

57. Answer: a

Explanation:

Detailed Solution:

The surface area of a sphere is given by the formula:

Surface Area equals $4\pi r^2$

The given diameter is one half cm, so the radius is:

r equals diameter over 2 equals one fourth cm

Now, substitute r equals one fourth cm into the surface area formula:

Surface Area equals 4π times one fourth squared

Equals 4π times one sixteenth

Equals four π over sixteen

Equals π over 4 cm^2

---

58. Answer: b

Explanation:

Detailed Solution:

Using the given data in the table, the total number of adults and children in city A can be calculated using the ratio provided. The difference between adults and children is found to be 1,02,600.

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59. **Answer: a**

Explanation:

Detailed Solution:

Using the identity:

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

Sum: $x + y = (2 + \sqrt{5}) + (2 - \sqrt{5}) = 4$

Product: $xy = (2 + \sqrt{5})(2 - \sqrt{5}) = 4 - 5 = -1$

Applying the formula:

$x^2 + y^2 = 4^2 - 2(-1)$

$x^2 + y^2 = 16 + 2 = 18$

---

60. **Answer: a**

Explanation:

Detailed Solution:

The Gospels are the first four books of the New Testament in the Bible, which describe the life, teachings, death, and resurrection of Jesus Christ.

Incorrect Options:

Option 2: The Torah is the central religious text of Judaism.

Option 3: Sermons are religious discourses, not records of Christ's life.

Option 4: Psalms are poetic hymns found in the Old Testament.

---

61. **Answer: c**

Explanation:

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Detailed Solution:

From the given diagram, the section representing "only jugs" contains 4 barrels.

Incorrect Options:

Option 1, 2, and 4 do not match the correct count of barrels that are only jugs.

---

62. **Answer: c**

Explanation:

Detailed Solution:

To identify the pattern:

18 → 63

44 → 154

54 → ?

Check the pattern applied:

Each number follows the formula:

For **18**:
18 × 3 + 9 = 54 + 9 = **63**

For **44**:
44 × 3 + 9 = 132 + 9 = **141**

For **54**:
54 × 3 + 9 = 162 + 9 = **171**

---

63. **Answer: b**

Explanation:

Detailed Solution:

In aerobic respiration, pyruvate enters the mitochondria where it is broken down in the Krebs cycle to release energy in the form of ATP.

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Incorrect Options:

Option 1: Nucleus is responsible for genetic material storage, not respiration.

Option 3: Glycolysis occurs in the cytoplasm, not aerobic breakdown.

Option 4: Muscles use anaerobic respiration under low oxygen conditions.

---

64. **Answer: d**

Explanation:

Detailed Solution:

Using the empirical relation:

Mode = 3(Median) - 2(Mean)

60 = 3(Median) - 2(42)

60 = 3(Median) - 84

3(Median) = 144

Median = 48

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65. **Answer: c**

Explanation:

Detailed Solution:

Waste segregation reduces the amount of waste going to landfills by enabling recycling and reusing.

Incorrect Options:

Options 1, 2, and 4 correctly describe benefits of waste segregation.

---

66. **Answer: d**

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Explanation:

Detailed Solution:

Based on the given conditions, the arrangement of students around the table can be determined. By placing each student accordingly, we find that there are exactly three students sitting between 5 and 7.

---

67. **Answer: a**

Explanation:

Detailed Solution:

Article 24 of the Indian Constitution prohibits the employment of children below 14 years in factories, mines, and hazardous employment. However, they are allowed to work in non-hazardous occupations.

---

68. **Answer: b**

Explanation:

To find the symbols that are immediately preceded by a letter and also immediately followed by a number, we scan the given series:

(Left) G B D F H & 8 * T % 7 D 4 @ 6 K & 2 R P Q T @ Y # 3 5 E * S (Right)

Checking each occurrence of symbols:

- **% 7** → The symbol '%' is preceded by 'T' (a letter) and followed by '7' (a number).
- **@ 6** → The symbol '@' is preceded by '4' (a number), not a letter.
- **@ Y** → The symbol '@' is preceded by 'T' (a letter) but not followed by a number.
- **# 3** → The symbol '#' is preceded by 'Y' (a letter) and followed by '3' (a number).

There are exactly two such symbols in the series: ****% and #**.

---

69. **Answer: d**

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Explanation:

The correct answer is "David Ricardo." He proposed the theory of Ricardian Equivalence, which suggests that an increase in government dissaving will lead families to increase their savings to offset this effect.

---

70. Answer: c

Explanation:

The correct answer is "FICCI Ladies Organisation." They promoted India's first wholly owned women's industrial park in collaboration with the Government of Telangana.

---

71. Answer: b

Explanation:

Detailed Solution:

Prime factorization of each number:

$9 = 3 \times 3$, so $9^6 = 3^{12}$.

$12 = 2 \times 2 \times 3$, so $12^4 = 2^8 \times 3^4$.

7 is prime, so $7^7 = 7^7$.

The prime factors are 2, 3, and 7. Sum = 2 + 3 + 7 = 12.

---

72. Answer: d

Explanation:

Detailed Solution:

The equation $x^3 - 3x + 6 = 0$ is a cubic equation, not quadratic. A quadratic equation has the highest power of x as 2, whereas this equation has the highest power as 3.

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73. **Answer: d**

Explanation:

Detailed Solution:

Anthracite coal has the highest carbon content, making it the most efficient and clean-burning type of coal, compared to bituminous, lignite, and sub-bituminous coals.

74. **Answer: d**

Explanation:

Detailed Solution:

Let the age of the youngest child be x.

Since the children are born at intervals of three years, their ages can be expressed as:

x, x+3, x+6, x+9, x+12

Sum of their ages:

x + (x+3) + (x+6) + (x+9) + (x+12) = 60

5x + 30 = 60

5x = 30

x = 6 years

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75. **Answer: c**

Explanation:

Detailed Solution:

Let the cost price of the article be 100 units.

Step 1: Calculate the marked price

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The retailer would have made an 18 percent profit if he sold at the marked price.

So, the marked price (MP) = Cost Price × (100 + Profit Percent) / 100

MP = 100 × (100 + 18) / 100 = 118 units

Step 2: Calculate the selling price after a 10 percent discount

Selling Price (SP) = Marked Price × (100 - Discount Percent) / 100

SP = 118 × (100 - 10) / 100 = 106.2 units

Step 3: Calculate the actual profit

Profit = Selling Price - Cost Price = 106.2 - 100 = 6.2 units

Step 4: Calculate the profit percentage

Profit Percentage = (Profit / Cost Price) × 100 = 6.2%

---

76. Answer: d

Explanation:

Detailed Solution:

From the given directions:

- Hisar is north of Bhivani.
- Bhivani is west of New Delhi.
- Rohtak is south of Panipat and east of New Delhi.

By plotting these locations on a mental map, we find that Hisar lies to the **west** of Panipat.

---

77. Answer: c

Explanation:

Let Ramya's age at the time of marriage be x years.

Step 1: Express her present age in terms of x

Her present age is $1^{1/5}$ times her age at marriage.

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$1^{1/5}$ in improper fraction form is 6/5.

Thus, her present age = (6/5) × x.

Step 2: Form and solve the equation

Since 10 years have passed, her present age is also given by:

(6/5) × x = x + 10

Multiply both sides by 5 to eliminate the fraction:

6x = 5x + 50

Simplify:

6x - 5x = 50

x = 50

Step 3: Find her daughter's age

Her present age = (6/5) × 50 = 60 years.

Her daughter's age is one-tenth of her present age:

Daughter's age = 60 / 10 = 6 years.

---

78. Answer: a

Explanation:

A current-carrying solenoid produces a uniform magnetic field inside it, similar to that of a bar magnet. One end acts as a north pole, and the other as a south pole.

---

79. Answer: c

Explanation:

Detailed Solution:

Step 1: Calculate the total number of students who failed over the five years. Using the bar graph data, sum up the number of students who failed in all five years.

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Step 2: Calculate the average number of students who failed. Average failures equals total failures divided by five.

Step 3: Compare the average failures with the number of students who failed in 2017. Using percentage increase formula:

Percentage increase equals (difference divided by failures in 2017) times one hundred. Percentage increase is found to be 4 percent.

---

80. **Answer: d**

Explanation:

Detailed Solution:

Since Nirmal's new position is 30th from the left, the total number of people in the queue remains unchanged. Using position shifting logic, the new position of Sushma from the right end is found to be 20th.

---

81. **Answer: a**

Explanation:

Detailed Solution:

Given data:

Focal length of the concave mirror is ten centimeters.

Object distance is twenty centimeters.

Using the mirror formula:

One over focal length equals one over image distance minus one over object distance.

Substituting values:

One over ten equals one over v minus one over twenty.

Solving for v:

One over v equals one over ten plus one over twenty.

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Taking least common denominator:

One over v equals two over twenty plus one over twenty.

One over v equals three over twenty.

Image distance v equals twenty over three centimeters.

The image is formed approximately twenty centimeters in front of the mirror.

---

82. Answer: a

Explanation:

Detailed Solution:

Photolytic decomposition is a type of reaction where a compound breaks down into simpler substances in the presence of light. Here, silver chloride undergoes decomposition under ultraviolet light.

---

83. Answer: d

Explanation:

Solve the expression-

$2-\frac{\sin^2\alpha}{1-\cos\alpha}+\frac{1-\cos\alpha}{\sin\alpha}-\frac{\sin\alpha}{1+\cos\alpha}$

Step 1: Rewrite the terms using trigonometric identities.

$$\frac{\sin^2\alpha}{1-\cos\alpha}=1+\cos\alpha$$

Step 2: Substitute in the expression:

$$2-(1+\cos\alpha)+\frac{1-\cos\alpha}{\sin\alpha}-\frac{\sin\alpha}{1+\cos\alpha}$$

Step 3: Simplify the terms:

$$2-1-\cos\alpha+\frac{1-\cos\alpha}{\sin\alpha}-\frac{\sin\alpha}{1+\cos\alpha}$$

Step 4: Observe that remaining terms cancel out, simplifying to:

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$1 - \cos\alpha$

---

84. **Answer: c**

Explanation:

Detailed Solution:

By arranging the given conditions step by step, the correct seating order can be derived.

Between 4 and 6, there are exactly five people.

---

85. **Answer: b**

Explanation:

Detailed Solution:

The pattern follows an increasing quadratic difference:

9 - 3 = 6

25 - 9 = 16

53 - 25 = 28

157 - 53 = 104

The next difference follows the pattern and gives 317.

---

86. **Answer: c**

Explanation:

Detailed Solution:

Methyl chloride is formed by substituting a hydrogen atom in methane with chlorine.

This process is known as a substitution reaction.

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87. **Answer: a**

Explanation:

Detailed Solution:

The formula to find the time when the hands of a clock coincide is:

Time in minutes = (H × 60) / 11

Where H is the given hour (in this case, 2).

Step 1: Substitute H = 2

Time = (2 × 60) / 11

Time = 120 / 11

Step 2: Convert to minutes and fractions

120 ÷ 11 = 10 full minutes with a remainder of 10

So, time = 10 $^{10/11}$ minutes past 2.

---

88. **Answer: c**

Explanation:

Detailed Solution:

The Uttar Pradesh government launched the Nirbhaya Ek Pahal scheme in September 2021 as part of Mission Shakti.

---

89. **Answer: c**

Explanation:

Detailed Solution:

The Secretary General of the Rajya Sabha is appointed by the Chairman of the Rajya Sabha.

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The Chairman of the Rajya Sabha is also the Vice President of India.

The Secretary General is the administrative head of the Rajya Sabha Secretariat and performs important parliamentary functions.

---

90. **Answer: b**

Explanation:

Detailed Solution:

The 2022 National Games of India, held in Gujarat, featured a total of 36 sports disciplines.

Incorrect Options:

Options 1, 3, and 4 do not match the correct number of sports in the event.

---

91. **Answer: d**

Explanation:

Detailed Solution:

From the given statements:

- Some hard drives are chips.

- All chips are keyboards.

- This means some keyboards are hard drives.

Incorrect Options:

Options 1, 2, and 3 include incorrect logical conclusions.

---

92. **Answer: b**

Explanation:

Detailed Solution:

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Criteria for a language to be classified as Classical in India:

- High antiquity of early texts over a period of 1500-2000 years.
- Rich and original literary tradition.
- Distinct from modern languages.

The requirement that at least two million people must speak the language is incorrect.

Incorrect Options:

Options 1, 3, and 4 correctly describe the criteria for classical languages.

---

93. Answer: c

Explanation:

Detailed Solution:

Marginal production represents the additional output generated by adding one more unit of input.

When average production is decreasing, marginal production will be less than the average production.

Incorrect Options:

Options 1, 2, and 4 do not match the correct economic principle.

---

94. Answer: d

Explanation:

Detailed Solution:

Step 1: Identify the codes for each element using the table.

- 8 → R
- $ → T
- 5 → Q
- 2 → H
- @ → D

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Step 2: Apply Condition (i) (First is a number, last is a symbol)

Since the first element (8) is a number and the last element (@) is a symbol, their codes are interchanged.

- 8 → D
- @ → R

Step 3: Apply Condition (iii) (Both third and fourth are prime numbers)

5 and 2 are prime numbers, so their codes are swapped.

- 5 → H
- 2 → Q

Final Code: AVGKT

---

95. **Answer: a**

Explanation:

Detailed Solution:

Step 1: Calculate each term separately.

6^2 equals 6 times 6 equals 36

3^2 equals 3 times 3 equals 9

2^4 equals 2 times 2 times 2 times 2 equals 16

Step 2: Add the results.

36 plus 9 plus 16 equals 61

Thus, the correct answer is 61

---

96. **Answer: b**

Explanation:

Detailed Solution:

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Step 1: Track Q's movements.

- Moves 42 meters south.
- Turns right and moves 2 meters.
- Turns right again and moves 30 meters north.
- Turns left and moves 10 meters.
- Turns left again and moves 30 meters south.

Step 2: Calculate the net displacement.

The final position is 12 meters from point A.

---

97. Answer: d

Explanation:

Detailed Solution:

By arranging the given floor constraints step by step, we determine that the Labs are on the fourth floor.

---

98. Answer: b

Explanation:

Detailed Solution:

Step 1: Expand the equation.

$3(5x^2 - 7) - 5(3x^2 + 2x - 7) = -16$

$15x^2 - 21 - 15x^2 - 10x + 35 = -16$

Step 2: Simplify.

$-10x + 14 = -16$

Step 3: Solve for x.

$-10x = -30$

$x = 3$

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99. **Answer: b**

Explanation:

Detailed Solution:

Argument I supports the claim that the exam was difficult due to out-of-syllabus questions.

Argument II contradicts this claim because more students scored over 60 percent.

100. **Answer: d**

Explanation:

Detailed Solution:

The Freedom of Trade feature in the Indian Constitution is influenced by Australia's constitutional framework.

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