



# National Analytical Brains Competition 2024

## NAB Competition 2024- Grade 08

### Mathematical Ability

All questions are mandatory. Please note there is no negative marking:

1. What is the square root of the product of two numbers whose individual square roots are 12 and 18?  
(a) 30                      (b) 216                      (c) 54                      (d) 114
2. The square root of a number is 15. What will be the square of the number?  
(a) 3375                      (b) 506250                      (c) 33750                      (d) 50625
3. The side of a cube is the same as the height of a cylinder. If the base radius of the cylinder is half the side of the cube, what is the ratio of the volume of the cube to that of the cylinder?  
(a) 14 : 11                      (b) 7 : 22                      (c) 7 : 11  
(d) 11 : 28                      (e) None of these
4. If double of the difference between the cube of a number and the square of the same number is 360, what is the number?  
(a) 8                      (b) 10                      (c) 6                      (d) 12
5. A student scored 60% in Mathematics and 80% in Science. If the total marks for Mathematics are 150 and for Science are 200, what is the combined percentage score of both the subjects?  
(a) Below 71%                      (b) Between 71 to 72%  
(c) Above 72%                      (d) 70%



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6. If the length of a rectangle is halved and its breadth is tripled, how will the perimeter change?
- (a) It will increase (b) It will decrease  
(c) Will remain the same  
(d) Any one of the above can be correct depending on the value of length and breadth
7. Two types of chocolates, A and B, are sold in a shop. Chocolate A costs ₹10 for 2 pieces, while Chocolate B costs ₹20 for 3 pieces. Which chocolate offers better value for money, and by what percentage is it better?
- (a) Chocolate A, 5% (b) Chocolate B, 5%  
(c) Chocolate B, 25% (d) Chocolate A, 25%
8. If the ratio of boys to girls in a class is 3:5 and there are 16 more girls than boys, how many students are there in total?
- (a) 48 (b) 64 (c) 80 (d) 72
9. Two friends, X and Y, invest ₹5000 and ₹7000 respectively in a business. At the end of the year, they make a profit of ₹6000. If X decides to give 10% of his share of the profit to Y, how much will Y receive in total, considering X's donation?
- (a) ₹3500 (b) ₹3250 (c) ₹3750 (d) ₹2750
10. A car travels 120 km using 8 liters of petrol. How much petrol would be required for the same car to travel 180 km, assuming a 20% improvement in fuel efficiency?
- (a) 11 (b) 15 (c) 9 (d) 10
11. If a cube's volume is numerically equal to six times the sum of the areas of its six faces, what is the area of the top face of the cube?
- (a) 576 (b) 1296 (c) 36 (d) 216



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12. A man buys an article for 18% less than its value and sells it for 18% more than its value. His gain or loss percent is:
- (a) Gain is 36% (b) Gain is more than 36% but less than 40%  
(c) Gain is less than 36% (d) More than 40% gain
13. Pens are bought at 3 for ₹2 and sold at 2 for ₹3. Find the gain percent.
- (a) 300% (b) 200% (c) 125% (d) 25%
14. Which is the better offer?
- (i) Three successive discounts of 10%, 10%, and 30%  
(ii) Three successive discounts of 40%, 5%, and 5%
- (a) (i) offer is better (b) (ii) offer is better  
(c) Both are equal (d) Can't say
15. The cost of 6 identical pens is equal to the cost of 5 identical notebooks. If the total cost of 3 pens and 2 notebooks is ₹180, what is the cost of 6 pens?
- (a) ₹100 (b) ₹200 (c) ₹120 (d) ₹180
16. The difference between compound interest and simple interest on a sum for 2 years at 10% p.a. is ₹768. The sum is:
- (a) ₹68,400 (b) ₹72,500 (c) ₹76,800 (d) ₹82,000
17. How many spheres can be made out of a lead cylinder 28 cm high having a radius of 6 cm, each sphere being 1.5 cm in diameter?
- (a) 1694 (b) 1794 (c) 1782 (d) 1792
18. Number  $x$  is increased by the product of  $y$  and  $z$ . The result is divided by  $z$  and then decreased by  $y$ . Finally, that result is multiplied by  $z$ . Which of the following is the final result?
- (a)  $x$  (b)  $x + yz - y$  (c)  $x/z + y - z$  (d)  $x/z + y - yz$



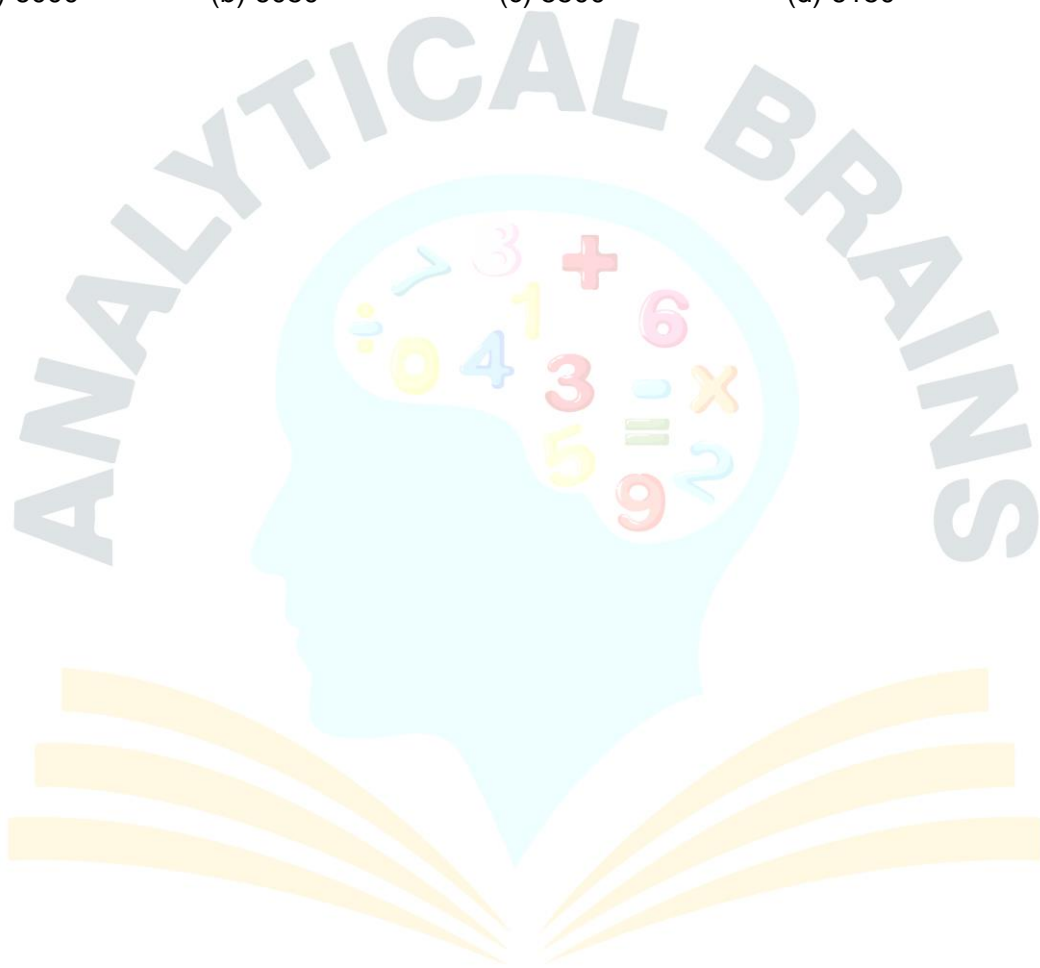
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19. What is the area of the largest triangle that can be fitted into a rectangle of length (L) units and width (W) units?

- (a)  $LW/3$             (b)  $LW/6$             (c)  $LW/4$             (d)  $LW/2$

20. The population of a town increases by 10% annually. If the current population is 5000, what will the population be after 2 years?

- (a) 6000            (b) 6050            (c) 5500            (d) 6150







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## Logical Reasoning:

All questions are mandatory. Please note there is no negative marking:

21. In the below question, arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence:

1. Page    2. Pagan    3. Palisade    4. Pageant    5. Palate

(a) 1, 4, 2, 3, 5    (b) 2, 4, 1, 3, 5    (c) 1, 4, 2, 5, 3    (d) 2, 1, 4, 5, 3

22. Find out how many such pairs of letters are there in the given word each of which has as many letters between them in the word as in the English alphabet: "PARADISE"

(a) None    (b) One    (c) Two    (d) Three    (e) Four

23. Kunal walks 10 kilometres towards North. From there, he walks 6 kilometres towards South. Then, he walks 3 kilometres towards East. How far and in which direction is he with reference to his starting point?

(a) 5 kilometres West    (b) 5 kilometres North-east  
(c) 7 kilometres East    (d) 7 kilometres West

24. In a particular way of coding, the word "CENTRAL" is coded as "ABCDEFGH" and "PLANETARIUM" as "HGFCBDFEIJK". With the same coding, how can we express the word LANTERN?

(a) GFCD FEG    (b) GFCDEFG    (c) GFCDBEC    (d) GFCDBEB

25. A number series is given with one term missing. Choose the correct alternative that will continue the same pattern and replace the question mark in the given series: 8, 28, 116, 584?

(a) 1752    (b) 3502    (c) 3504    (d) 3508

26. Find the number which will replace the '?' mark.

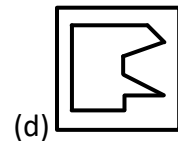
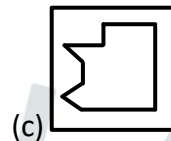
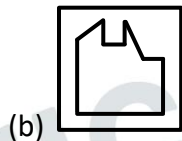
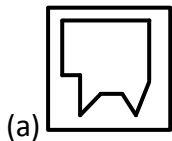
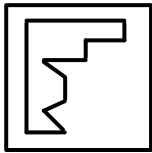
(a) M    (b) Z    (c) Q    (d) S





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32. Select a figure from the given four options which fits exactly into Figure (X) to form a complete square.



33. In how many ways can you distribute 15 identical balls into two non-identical boxes so that none are empty?

- (a) 15                      (b) 14                      (c) 8                      (d) 7

34. A cube is colored red on all faces. It is cut into 64 smaller cubes of equal size. How many cubes have no face colored?

- (a) 24                      (b) 16                      (c) 8                      (d) 0

35. A dice with six faces is marked with six numbers 1, 2, 3, 4, 5, and 6 respectively. This dice is rolled three times and three positions are shown as below. Find the number opposite to 1.



- (a) 2                      (b) 6                      (c) 5                      (d) 4

36. A, B, C, D, and E are five friends. A is shorter than B but taller than E. C is the tallest. D is shorter than B and taller than A. Who has two persons taller and two persons shorter than him/her?

- (a) A                      (b) B                      (c) C                      (d) D



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37. In a certain code language 'I will go' is written as 'ta ma ra' and 'I will eat' is written as 'ta ma ga', then code for 'eat' is:

- (a) ga                      (b) ma                      (c) ta                      (d) ra                      (e) None of these

38. If NOIDA is written as 39658, how will INDIA be written?

- (a) 36568                      (b) 63568                      (c) 63569                      (d) 65368

39. How many such symbols are there in the above arrangement each of which is either immediately followed by a number or immediately preceded by a letter, but not both?

J Y 2 = S £ ξ E G M π 7 \$ H P K L β @ W Q 1 3 # C D ©

- (a) NIL                                      (b) One                                      (c) Two  
(d) Three                                      (e) More than Three

40. What number letter/character should replace the question mark?

6	9	15
8	12	20
4	6	?

- (a) 5                                      (b) 10                                      (c) 15                                      (d) 20





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## Daily Life Problem:

All questions are mandatory. Please note there is no negative marking:

### Study the following information carefully:

- (i) B and E are good in Dramatics and Computer Science.
- (ii) A and B are good in Computer Science and Physics.
- (iii) A, D and C are good in Physics and History.
- (iv) C and A are good in Physics and Mathematics.
- (v) D and E are good in History and Dramatics.

### Answer the below five questions based on the above information:

41. Who is good in Physics, History, and Dramatics?  
(a) A                      (b) B                      (c) D                      (d) E
42. Who is good in Physics, History, and Mathematics, but not in Computer Science?  
(a) A                      (b) B                      (c) C                      (d) D
43. Who is good in Computer Science, History, and Dramatics?  
(a) A                      (b) B                      (c) C                      (d) E
44. Who is good in History, Physics, Computer Science, and Mathematics?  
(a) A                      (b) B                      (c) C                      (d) D
45. Who is good in Physics, Dramatics, and Computer Science?  
(a) A                      (b) B                      (c) D                      (d) E
46. In a dairy, there are 60 cows and buffaloes. The number of cows is twice that of buffaloes. Buffalo X ranked twentieth in terms of milk delivered. If there are 13 cows ahead of Buffalo X, how many buffaloes are after in rank in terms of milk delivered?  
(a) None                      (b) 7                      (c) 13                      (d) 27



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47. A invested Rs. 6000 in a business and after 4 months, B also joined him. At the end of the year, B received Rs. 1600 profit out of Rs. 4600. Find the investment of B.  
(a) ₹4800            (b) ₹3200            (c) ₹4000            (d) ₹4600
48. MRP of a Laptop is Rs. 96000 and the shopkeeper is giving a discount of 20%. But you are asking him to give a 25% discount. If he agrees, then how much more money will you be able to save?  
(a) ₹19200            (b) ₹24000            (c) ₹4800            (d) ₹72000
49. You are looking to buy a new TV and below are three offers available. Which one is the better deal?  
A: 50 percent discount.  
B: Successive discount of 35% and 20%.  
C: Successive discount of 30%, 20%, and 10%.  
(a) A            (b) B            (c) C            (d) All are equal
50. Riya has 60 chocolates. She decides to distribute half of her chocolates in class on her birthday. Then, she eats 5 chocolates from the remaining ones. Next, she gives one-third of what's left to each teacher after keeping 10 chocolates with herself. To how many teachers did she give the chocolates?  
(a) 3            (b) 5            (c) 7            (d) 8