



National Analytical Brains Competition 2024

NAB Competition 2024- Grade 07

Mathematical Ability

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

- Find the smallest positive integer kkk such that the square of kkk is divisible by both 8 and 18.
(a) 1 (b) 36 (c) 24 (d) 18 (e) 12
- If you divide the additive inverse of $1/8$ by the multiplicative inverse of $1/8$ what will be the answer?
(a) 1 (b) -1 (c) $-1/64$ (d) $1/64$
- If $A = (-1)^{206}$, $B = (-1)^{206}$, $C = (100)^0$, and $D = (-1)^{205}$. Find the value of $A + B + C + D$?
(a) 3 (b) -3 (c) 2 (d) -2
- A number is divided by 6 and then increased by 5 to result in 17. What is the number?
(a) 72 (b) 2 (c) 12 (d) 24
- Which equation is not true?
(a) $1.25 = 1\frac{1}{4}$ (b) $6.05 < 6.5$ (c) $2\frac{4}{100} = 2.4$ (d) $4\frac{1}{4} > 4\frac{1}{5}$
- $x - \frac{2x+8}{3} = \frac{1}{4} \left(x - \frac{2-x}{6} \right) - 3$, value of x is
(a) $x = 10$ (b) $x = -10$ (c) $x = 0$ (d) $x = 20$
- There are 3 articles. The cost of the first article is two-fifth the cost of the third article, and the cost of the third article is twice the cost of the second article. If the total cost of the three articles is Rs. 228, find the cost of the first article.
(a) Rs. 48 (b) Rs. 58 (c) Rs. 38 (d) Rs. 84

8. A man sells two items, each at a 10% profit. However, due to a mistake, he sells the second item at 10% below cost price. What is the overall profit or loss percentage on the two items combined if each item cost ₹200?
- (a) 5% Profit (b) 10% Profit (c) 0% (No Profit, No Loss) (d) 5% Loss
9. A number is multiplied by 4 and then 7 is added to the result. If the final result is 35, what is the original number?
- (a) 5 (b) 6 (c) 7 (d) 8
10. If $\frac{2}{3}$ of a number is increased by 8, the result is equal to $\frac{5}{6}$ of the same number decreased by 2. What is the number?
- (a) 12 (b) 60 (c) 48 (d) 16
11. A store applies two different discounts to two separate items. For the first item priced at ₹50, a 12% discount is applicable. For the second item priced at ₹120, a 5% discount is applicable. If you accidentally reversed the percentages and applied 5% to the first item and 12% to the second item, what is the difference between the total amounts calculated (rounded off to Rupees)?
- (a) ₹0 (b) ₹5 (c) ₹10 (d) ₹7.5
12. M men agreed to rent a house for a total of R rupees. By the time they signed the contract, the price had increased by 1000 rupees. Find the amount each man had to contribute as his total share.
- (a) R / M (b) $(R / M) + 100$ (c) $(R + 1000) / M$ (d) $(M + 1000) / R$
13. At a stationary shop, the first 6 pens purchased cost ₹55 a piece, and additional pens cost ₹C a piece. If a customer paid ₹564 for 12 pens, what is the value of C?
- (a) ₹47 (b) ₹55 (c) ₹40 (d) ₹39
14. A bucket of 20 liters is 35% full with water. How many liters of water must be added so that it is 65% full with water?
- (a) 5 Liters (b) 7 Liters (c) 6 Liters (d) 4 Liters

15. Arrange in ascending order.

$$\frac{-4}{7}, \frac{-5}{-2}, \frac{-2}{5}$$

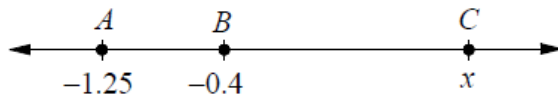
(a) $\frac{-4}{7}, \frac{-2}{5}, \frac{-5}{-2}$

(c) $\frac{-2}{5}, \frac{-4}{7}, \frac{-5}{2}$

(b) $\frac{-5}{-2}, \frac{-2}{5}, \frac{-4}{7}$

(d) $\frac{-5}{-2}, \frac{-4}{7}, \frac{-2}{5}$

16. On the number line below, if $BC=2AB$ then what is the value of x ?



(a) 1.3

(b) 1.7

(c) 2.1

(d) None of these

17. The quotient of p and q is twelve less than three times the sum of p and q . Which of the following equations represents the statement above?

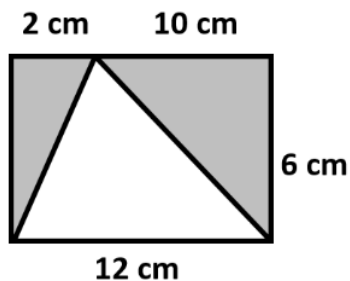
(a) $\frac{p}{q} = (3p + q) - 12$

(c) $\frac{p}{q} = 3(p + q) - 12$

(b) $\frac{p}{q} = 12 - (3p + q)$

(d) $\frac{p}{q} = 12 - 3(p + q)$

18. Find the area of the shaded region.



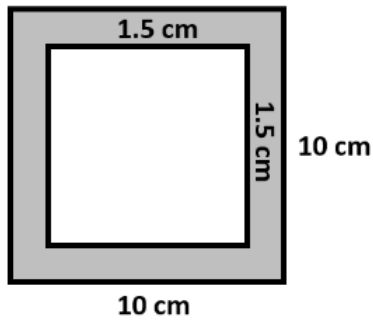
(a) 36 Sq. m

(b) 36 Sq. Cm

(c) 34 Sq. m

(d) 34 Sq. Cm

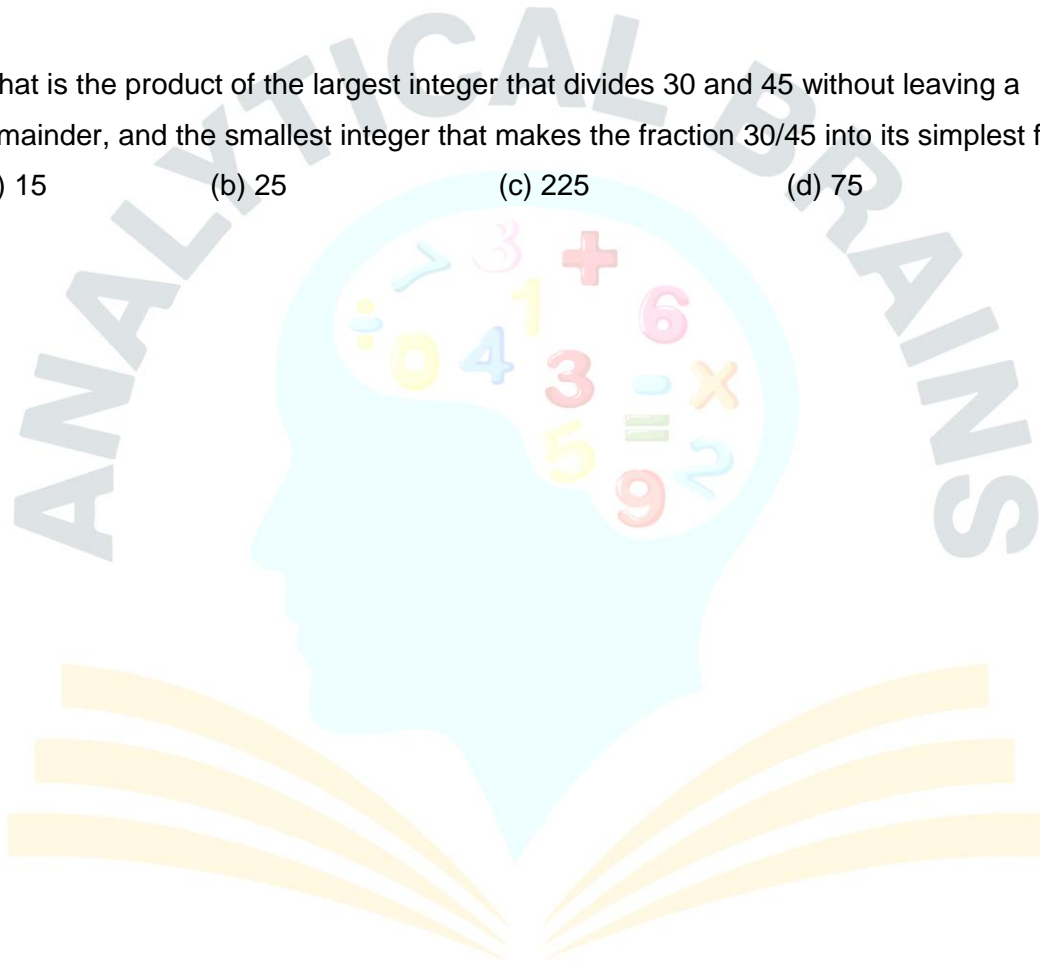
19. Find the area of the shaded region.



- (a) 51 Sq. cm (b) 51 Sq. m (c) 15 Sq. cm (d) 15 Sq. m

20. What is the product of the largest integer that divides 30 and 45 without leaving a remainder, and the smallest integer that makes the fraction $\frac{30}{45}$ into its simplest form?

- (a) 15 (b) 25 (c) 225 (d) 75



Logical Reasoning

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

21. How many pairs of letters are there in the word "CAPTURED" that have the same number of letters between them in the word (in both forward and backward directions) as they have in the English alphabetical series?
- (a) One (b) Five (c) Two (d) Three
22. If "ACROSS" is coded as "CETQUU", in the same way, "CLIENT" is coded as "ENKGPV", then what is the code for "DEFINE"?
- (a) GFHKPG (b) BGHKPG (c) EGHLPG (d) FGHKPG
23. If in the number "256374815", the odd digits are increased by 2, and the even digits are decreased by 1, then which of the following digits are repeated more than two times?
- (a) Only 7 (b) Only 3 (c) Only 5 (d) Only 3 & 5
24. Which of the following words will come in the middle if all of them are arranged alphabetically as in a dictionary?
- (a) Rumbustious (b) Rumanian (c) Rumour
(d) Ruminare (e) Rurple
25. Which letter in the below alphabet series is as far from G as T is from M?
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
- (a) M (b) N (c) O (d) P
26. Danish starts walking straight toward East, after walking 98 m, he turns to the left and walks 37 m straight. Again he turns to the left, walks a distance of 44 m straight, and again he turns to the left and walks a distance of 37 m. How far is he from the starting point?
- (a) 44 m (b) 54 m (c) 37 m (d) 135 m
27. If 'SHOW' is coded as 'TGPV', then how will 'NINE' be coded?
- (a) OHOD (b) DOHO (c) HOOD
(d) DOOH (e) None of these

28. Based on the below series, four of the following five are alike in a certain way and so form a group. Which is the one that does not belong to that group?

\$ R B 3 A K 7 £ # 9 \$ U D I N 4 6 % F H 2 @ 8 W

- (a) % H N (b) I 4 \$ (c) 9 D £ (d) 3 K \$

29. Which number will replace question mark?

6, 13, 28, 59, ?

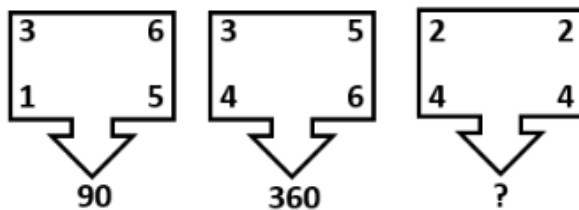
- (a) 111 (b) 113 (c) 114 (d) 122

30. Some of the letters are missing which are given in that order as one of the alternatives below it. Choose the correct alternative.

gfe _ ig _ eii _ fei _ gf _ ii

- (a) eifgi (b) figie (c) ifgie (d) ifige

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



- (a) 64 (b) 400 (c) 360 (d) 380

32. Choose the odd numerical pair/group from the below options:

- (a) 16 – 64 (b) 9 – 36 (c) 36 – 216 (d) 49 – 343

33. Haadya is 10 ranks ahead of Haani who ranks twenty-third in a class of 42. What is Haadya's rank from the last?

- (a) 30 (b) 29 (c) 19 (d) 32

34. If $A + B$ means A is the son of B, $A - B$ means A is the wife of B, $A \times B$ means A is the brother of B, $A \div B$ means A is the mother of B, $A = B$ means A is the sister of B. Then what does $P \times R \div Q$ mean?

- (a) P is the brother of Q (b) P is the father of Q
(c) P is the uncle of Q (d) P is the nephew of Q

35. Choose the correct mirror image of the fig(x) from amongst the four alternatives (a), (b), (c), and (d) given with it:

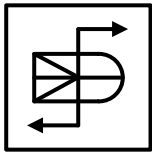
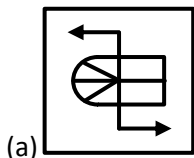
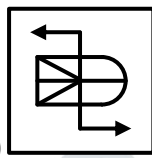


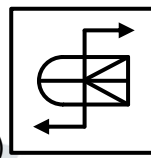
Fig. (x)



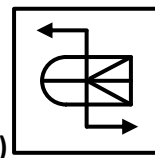
(a)



(b)



(c)



(d)

36. If the mirror is placed vertically, then identify the correct mirror image of:

O B S T I N A T E ?

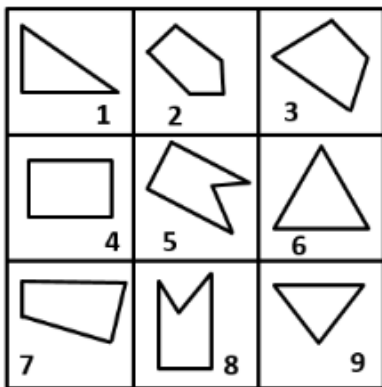
(a) **ETANITZBO**

(b) **BOSTINATE**

(c) **ETANITSBO**

(d) **SOBTNIATE**

37. Group the given figures into three classes using each figure only once and choose the appropriate option:



(a) 7, 8, 9; 1, 3, 4; 1, 5, 6

(b) 1, 1, 3; 4, 5, 7; 6, 8, 9

(c) 1, 6, 8; 3, 4, 7; 2, 5, 9

(d) 1, 6, 9; 3, 4, 7; 2, 5, 8

38. A boy has 15 pens. All but six lost. How many was he left with?

(a) 9

(b) 6

(c) 21

(d) None of these

39. All surfaces of a cube are coloured. If a number of smaller cubes are taken out from it, each side $\frac{1}{4}$ the size of the original cube's side, indicate the number of cubes with only one side painted.

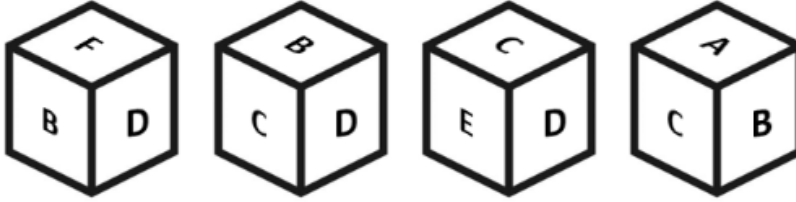
(a) 60

(b) 32

(c) 24

(d) 16

40. Which face is opposite to the face with alphabet B, if four positions are given as below?

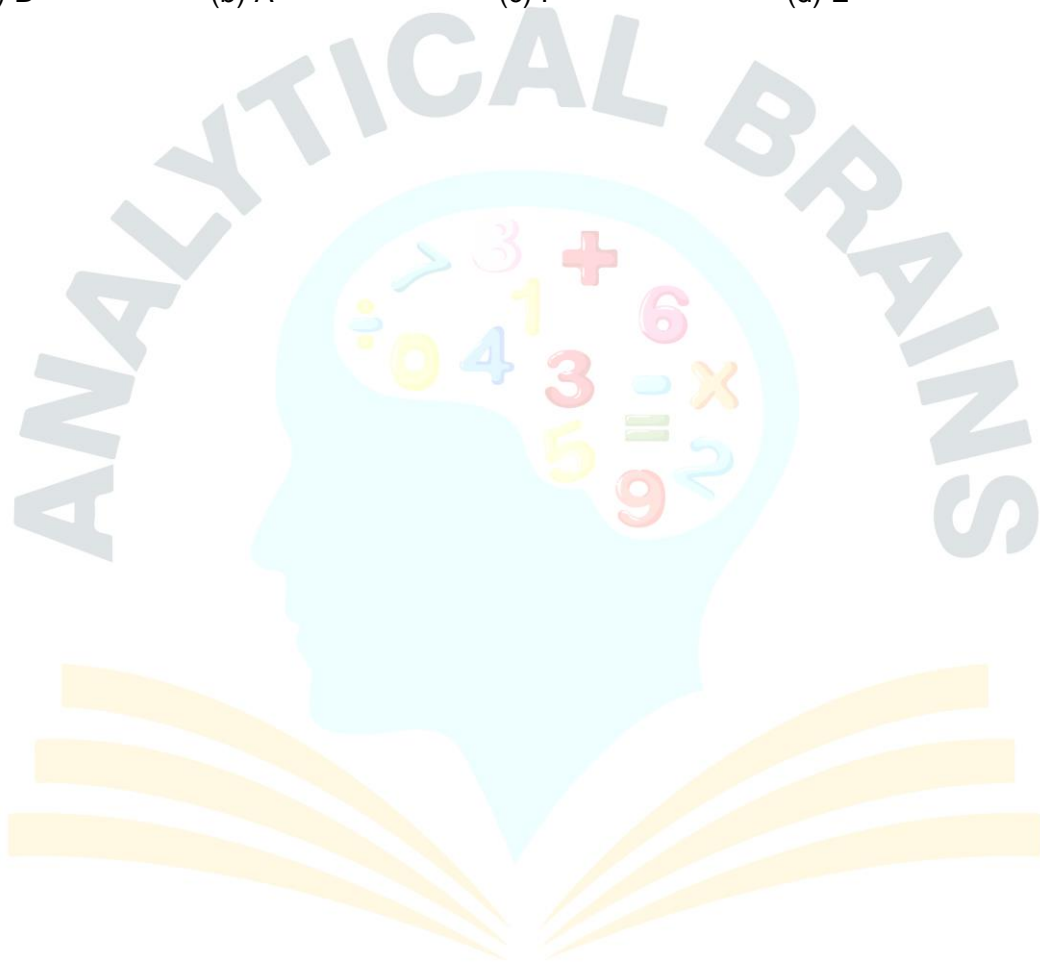


(a) B

(b) A

(c) F

(d) E



Daily Life Problem:

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

At a local market, three friends — Ankit, Kabir, and Satvik — are carefully planning their fruit purchases. Each of them has a budget of ₹40. Ankit buys 6 apples, 4 oranges, and 2 bananas. Kabir buys 5 apples, 6 oranges, and 3 bananas. Satvik buys 4 apples, 8 oranges, and 5 bananas. The price of one apple is ₹3, one orange is ₹2, and one banana is ₹1. However, due to a special market discount, Satvik received a 10% discount on his total bill, while Ankit had to pay an additional ₹2 for packaging. Now, they want to compare their final spending and how much budget each person has left. Can you help determine who spent the most and who spent the least, and by how much?

41. What is the total amount Ankit spent including the packaging fee?
(a) ₹32 (b) ₹30 (c) ₹34 (d) ₹28
42. After applying the 10% discount, how much did Satvik spend?
(a) ₹30.70 (b) ₹31.20 (c) ₹29.70 (d) ₹33.00
43. How much more did Ankit spend compared to Satvik, after factoring in Satvik's discount and Ankit's packaging fee?
(a) ₹0.50 (b) ₹0.30 (c) ₹1.70 (d) ₹3.00
44. Who spent the least amount after considering all costs and discounts?
(a) Ankit (b) Kabir
(c) Satvik (d) Both Ankit and Kabir
45. If Ankit had received a ₹5 discount instead of paying ₹2 for packaging, how much total would he have spent?
(a) ₹25 (b) ₹27 (c) ₹23 (d) ₹31

Daily Life Problem Part - II:

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

Read the following information carefully and answer the below 5 questions given below it:

There are five friends - Satvik, Tanmay, Devin, Priyansh and Vihaan. Satvik is shorter than Tanmay but taller than Vihaan. Devin is the tallest. Priyansh is a little shorter than Tanmay and little taller than Satvik

46. Who is the shortest?

- (a) Vihaan (b) Satvik (c) Anuj (d) Tanmay (e) None of these

47. If they stand in the order of their heights, who will be in the middle?

- (a) Tanmay (b) Vihaan (c) Satvik (d) Priyansh (e) None of these

48. If they stand in the order of increasing heights, who will be the second?

- (a) Priyansh (b) Satvik (c) Vihaan (d) Tanmay (e) None of these

49. Who is the second tallest?

- (a) Satvik (b) Tanmay (c) Priyansh (d) Vihaan (e) None of these

50. Who is taller than Priyansh but shorter than Devin?

- (a) Tanmay (b) Vihaan (c) Satvik (d) Data inadequate (e) None of these