



National Analytical Brains Competition 2023

NAB Competition 2023 - Grade 07

Mathematical Ability

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

1. Find the number obtained when ninety is divided by three more than the sum of 8 and 7.

- 6
- 5
- 10
- 8

2. Find the length of the rectangle whose breadth is 20 cm and perimeter is 90 cm?

- 25 cm
- 15 cm
- 20 cm
- 19 cm
- None of these

3. Aasna and her friends went to see a movie and there they ordered 3 bags of popcorn and 4 drinks from the snack stand. Which option could be used to find **C**, the total cost if **P** represents the cost of a bag of popcorn and **D** represents the cost of a drink?

- $C = 7(P + D)$
- $C = 3P + 4D$
- $C = 7(P - D)$
- $C = 7P + 7D$



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4. Simplify the following:

$$\frac{\frac{5}{3} + \frac{5}{3} + \frac{5}{3}}{\frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5} + \frac{3}{5}}$$

- 1
- $\frac{5}{3}$
- $\frac{3}{5}$
- $\frac{9}{25}$

5. Which rational number does not have a reciprocal?

- 1
- 1
- All rational number have reciprocal.
- 0

6. What is the value of the expression

$$(-3) + (-12) \div (-4) - 3 \times (-3)$$

- 9
- 8
- 14
- 9



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7. After 10 years Arpit will be three times as old as he was four years ago. What is his present age?

- 12 years
- 10 years
- 11 years
- can't say

8. A dropped super ball rebounds one-third the distance of its preceding height on each bounce. If such a ball is dropped from a window 72 feet off the ground, how high will it rebound after three bounces?

- 24 feet
- $\frac{8}{3}$ feet
- 8 feet
- 18 feet

9. Scientists are studying the temperature changes at an experimental weather station. The first reading is 22° . If the temperature rose 10° at the second reading, dropped 25° at the third reading, dropped 15° at the fourth, and rose 21° at the fifth. What was the lowest reading recorded?

- 14
- 8
- 13
- 7



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10. A fruit basket has 20 apples out of which 30% are rotten. How many good apples are there in the basket?

- 14
- 6
- 15
- 17

11. Find the multiplicative inverse of $2/3 + 1/4$

- $-11/12$
- $-12/11$
- $12/11$
- $11/12$

12. In a bag the number of one rupee coins is three times the number of two rupee coins. If the total worth of the coins is ₹120, Find the number of two rupee coins.

- 12
- 24
- 42
- Can't say



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13. What do you mean by:

$$\frac{1}{2} \div 4$$

- How many groups of $\frac{1}{2}$ are there in 4?
- What is $\frac{1}{2}$ of 4?
- If you split $\frac{1}{2}$ into 4 equal shares, how big is each share?
- None of these

14. Find the rational number that should be subtracted from 5 so as to get $\frac{7}{9}$?

- $-\frac{36}{9}$
- $\frac{36}{9}$
- $\frac{38}{9}$
- $-\frac{38}{9}$

15. There are 20 Math books in a bookcase. When the number of books increases by x percent, the new number of Math books is 26. What is the value of x ?

- 46%
- 70%
- 120%
- 30%



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16. In a hostel mess 50 kg rice is consumed per day. If each student gets 400 gram of rice per day, find the number of students in the hostel.

- 125
- 145
- 115
- 600

17. A box is to be built to hold 72 cubic feet of tools. If the rectangular container must be 36" wide and 48" long, what must the height be to accommodate the tools?

- 72"
- 6"
- 36"
- 48"

18. Which of these situations is about volume?

- determining the amount of fencing it takes to go around a square garden
- determining how many tiles it will take to cover the kitchen floor
- determining how many rectangular containers of food will fit into a freezer
- None of these

19. The quantities x and y are positive. If x is decreased by 10 percent and y is increased by 10 percent, then the product of x and y is:

- unchanged
- decreased by 10%
- increased by 10%
- decreased by 1%



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20. A cycling club is planning a 1,500 km trip. The cyclers' average speed is 15 kilometer per hour. What additional information is needed to determine the number of days it will take them to complete the trip?

- The number of cyclists in the club
- The number of miles of rough terrain
- The number of hours they plan to cycle each day
- Their average speed per minute



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Logical Reasoning Ability

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

Q 21: Which of the following words will come in the middle if all of them are arranged alphabetically as in a dictionary?

- Apology
- Branch
- Antigen
- Antique
- Antipathy

Q 22: In a four members' family, R is the wife of P while L is the son of P and R. D is the grandson of P. How is D related to L?

- Father
- Brother
- Son
- Uncle
- None of these

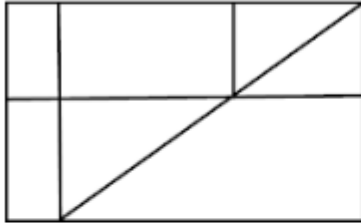
Q 23: If each of the odd digits in the number 54638 is decreased by 1 and each of the even digits is increased by 1, then which one of the following will be the sum of the digits of the new number?

- 25
- 26
- 28
- 29
- None of these



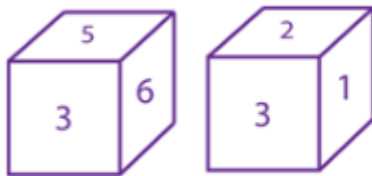
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Q 24: How many rectangles are there in the given figure?



- 10
- 11
- 8
- 9

Q 25: Two positions of the same dice are given, which of the following number will be opposite to 1?



- 4
- 6
- 5
- 2

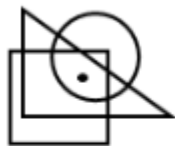
Q 26: I am facing south and after 20 meter walk, I turn right and walk another 20 meter. Then I turn right again and walk another 20 meter. How far away I am from the starting point

- 0 meters
- 20 meters
- 40 meters
- 60 meters



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Q 27: From amongst the four options select the one which satisfies the same condition of placement of **Dot** as in the given **figure X**



X



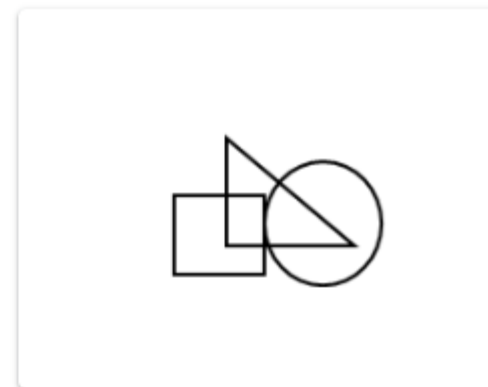
Option 1



Option 2



Option 3



Option 4

Q 28: One term in the below series is wrong . Find that out?

2, 5, 10, 50, 500, 5000

5

10

50

5000



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Q 29: Find the missing number in the below pattern.

96	
16	12

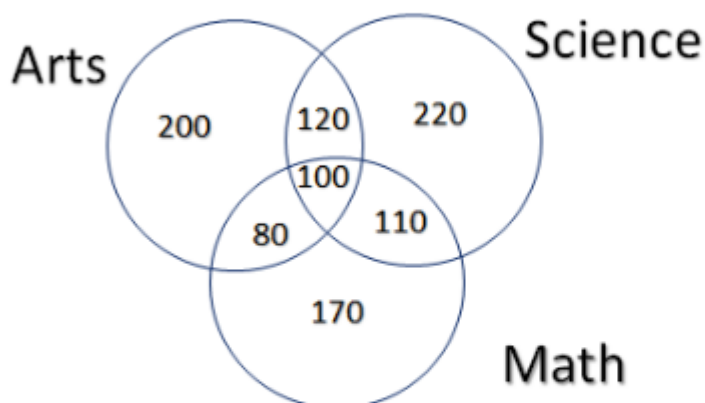
54	
18	6

63	
?	9

- 7
- 27
- 14
- 16
- None of these

Q 30: A result of survey of 1000 students with respect to their knowledge of Math, Science and Arts is given below.

What is the ratio of those who know all subjects to those who know math only.



- 5:18
- 10:17
- 12:19
- 5:4



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Q 31: Find the group of letters which don't have more than two vowels?

- BDEJOLY
- JKAPIXU
- PRAQEOS
- ZILERAM

Q 32: fig. (X) is exactly embedded in any one of the four option figures [a], [b], [c] and [d]. Find the option which contains fig.(X) as its part



Option 1



Option 2



Option 3



Option 4



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Q 33: In a certain code , EAT is written as 318 and CHAIR is written as 24156. How 'TEACHER' will be written?

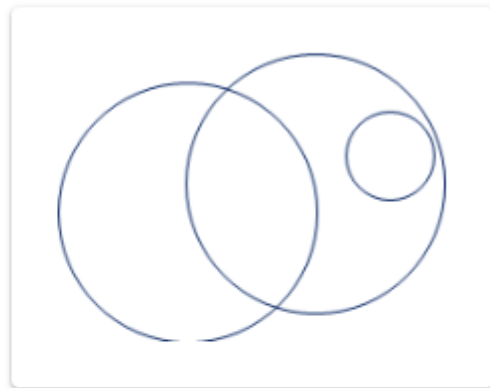
- 8312346
- 8321436
- 8312436
- 8313426

Q 34: Which one of the following is the most appropriate description of the below three items:

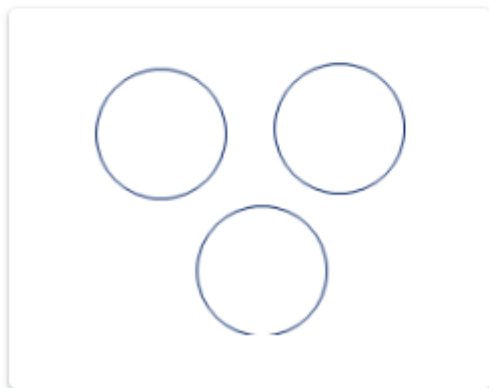
Triangles, Scalene Triangles, Right angled Triangles



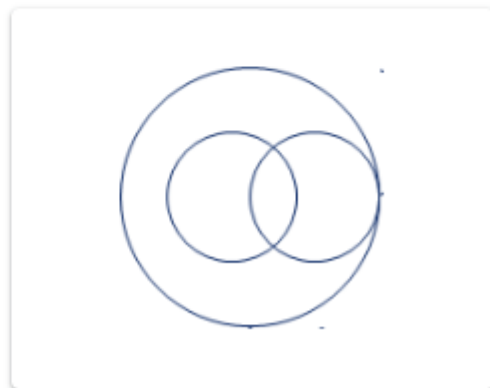
Option 1



Option 2



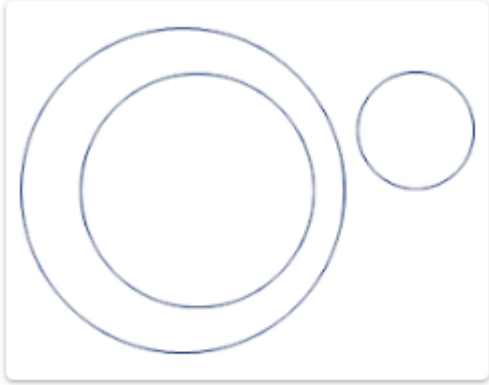
Option 3



Option 4



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Option 5

Q 35: Find the missing term.

AI, BJ, CK, ?

DL

DM

GH

LM

Q 36: Which figure will come next in the below series?



A



B



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C



D

Q 37: There is a certain relation between the words on either side of ::. Find the missing word that best matches.

Food : Stomach :: Fuel : ?

- Plane
- Truck
- Car
- Engine

Q 38: In a certain code language 'Bright Student' is written as 'su mo' and 'Intelligent Student' written as 'mo se', then code for 'student' is

- su
- se
- mo
- sm



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Q 39: Which one of the following interchanges in signs and numbers would make the equation true?

$$4+11-1=8$$

- + and -, 1 and 4
- + and -, 11 and 4
- + and -, 11 and 1
- None of these

Q 40: In a class of 52, where girls are three times that of boys, Aarush ranked 13th from the top. If there are 7 girls a head of Aarush, how many boys are before him in the rank.

- 12
- 8
- 7
- 5



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Real Life Problems

Study the following information and answer the questions from 41 to 46 :

A courier boy has five boxes A, B, C, D and E, that he need to deliver. Each box is having different weights.

1. A weighs twice as much as B
2. B weighs four and a half times as much as C
3. C weighs half as much as D
4. D weighs half as much as E
5. E weighs less than A but more than C

Hint: You may assume weight of one box to answer the questions.

Q 41: Which of the following is the lightest in weight?

- A
- B
- C
- D
- E

Q 42: E is lighter in weight than which of the other two articles?

- A,B
- D,C
- A,C
- D,B
- B,E



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Q 43: E is heavier than which of the following two articles?

- D,B
- D,C
- A,C
- A,B
- None of these

Q 44: Which of the following articles is the heaviest in weight?

- A
- B
- C
- D
- E

Q 45: Which of the following represents the descending order of weights of the articles ?

- A, B, E, D, C
- B, D, E, A, C
- E, C, D, A, B
- C, A, D, B, E
- A, B, D, E, C



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Q 46: Which of the above given statements is not necessary to determine the correct order of the articles according to their weights ?

- 1
- 2
- 3
- 4
- 5

Q 47: Adhiraj is meeting some friends for a movie and a dinner. he needs to be finished with dinner by 8:30 p.m. to make it home by 9:00 p.m. The movie runs for 90 minutes, and he wants to have at least 1 hour for dinner. If it takes 20 minutes to get from the theater to the restaurant, what is the latest starting time he can choose for the movie he wants to see?

- 6:10 p.m.
- 5:40 p.m.
- 7:10 p.m.
- 6:40 p.m.

Q 48: Manit spent ₹950 at a lunch party, then spent three times that amount at the amusement park. He had ₹780 left. How much money did he have initially?

- ₹1630
- ₹1730
- ₹3630
- ₹4580

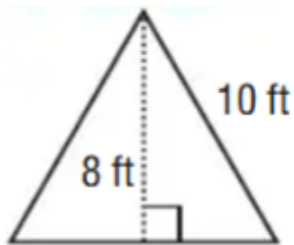


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Q 49: Himanshu plans to repaint his living bedroom. Each wall is 140 square feet. Three walls need a single coat of paint and the fourth wall needs a double coat. If each Can of paint will cover 200 square feet, how many Cans of paint does Himanshu need?

- 3
- 4
- 5
- 2

Q 50: The cross-section of a camping tent is shown. Find the width of the base of the tent.



- 6 ft
- 8 ft
- 10 ft
- 12ft