

Learning objectives

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|------------------------------------|---|
| 1.1 Number and Number Names | 1.2 Place Value and Face Value |
| 1.3 Expanded Form and Short Form | 1.4 Comparison of Numbers |
| 1.5 Ascending and Descending Order | 1.6 Forming Numbers with and without Repetition of Digits |

1.1 NUMBER AND NUMBER NAMES

We have already learnt numbers upto 999. Here, we learn the numbers beyond 999. Before learning these numbers, let's revise the numbers upto 999 by means of examples.

9	+	1	=	10
Largest one digit number		One more		Smallest two digit number
99	+	1	=	100
Largest two digit number		One more		Smallest three digit number
999	+	1	=	1000
Largest three digit number		One more		Smallest four digit number

Number Names

	Th	H	T	O	
	5	2	0	4	→ Four
	↓	↓			
	Five thousand	Two hundred			

∴ Number name for 5204 is five thousand two hundred four.

**Olympiad Bite**

The place value and face value of a digit is always same at ones place.

1.2 PLACE VALUE AND FACE VALUE**Place value**

The place value of a digit is its value at the position it occupies in the number.

Face value

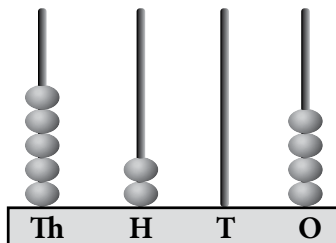
The face value of a digit is same as the digit itself in the number.

Number = 5204				
Places	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
Digits	5	2	0	4
Place value	5 thousands or 5000	2 hundreds or 200	0 tens or 0	4 ones or 4
Face value	5	2	0	4

Number on Abacus

An abacus is a tool used for counting.

Let us read the number 5204 shown on the abacus.



1.3 EXPANDED FORM AND SHORT FORM

The expanded form of a number is expressing the number as the sum of the place values of its digits.

Number = 5204				
	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
Digits	5	2	0	4
Place value	$5 \times 1000 = 5000$	$2 \times 100 = 200$	$0 \times 10 = 0$	$4 \times 1 = 4$

So, $5204 = 5000 + 200 + 0 + 4$

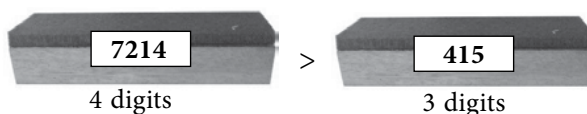
Short form Expanded form

SELF TEST - 1

- The place value of '8' in the number 9876 is _____.
 (A) 80 (B) 8
 (C) 800 (D) 8000
- How many thousands are there in 4050?
 (A) 405 (B) 4
 (C) 40 (D) 4050
- Digit at _____ place in a number has same place value and face value.
 (A) Thousands (B) Hundreds
- Which of the following shows expanded form of the number 8236?
 (A) $8000 + 20 + 30 + 6$
 (B) $8000 + 200 + 30 + 6$
 (C) $8 + 2 + 3 + 6$
 (D) $800 + 20 + 30 + 6$
- The largest four digit number is
 (A) 0999 (B) 1000
 (C) 9999 (D) 9000

1.4 COMPARISON OF NUMBERS

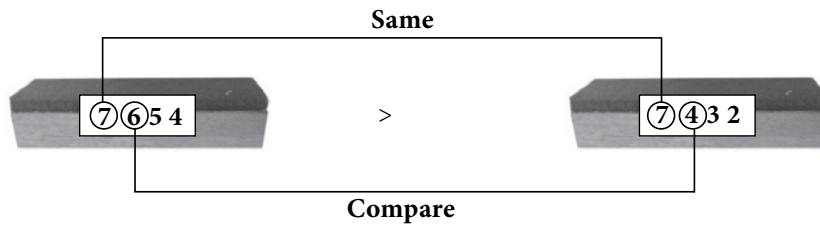
- If the numerals have different number of digits, then the numeral with more number of digits is greater.



- If the numerals have same number of digits, then we start comparing the digits from left to right, *i.e.*, compare digits at thousands place.



- If the digits at thousands place are same, then compare the digits at hundreds place.



- If the digits at thousands place as well as hundreds place are same, then compare the tens place digits.



- If the digits at thousands, hundreds and tens place are same, then compare the ones place digits.



1.5 ASCENDING AND DESCENDING ORDER

- The numbers are said to be in ascending order, if they are arranged from the smallest to the largest.
- The numbers are said to be in descending order, if they are arranged from the largest to the smallest.

Example : For the numbers 6568, 6254, 8956 and 8296,

Ascending order is :



Descending order is :



Olympiad Bite

- **Even numbers** : Numbers ending with 0, 2, 4, 6 or 8 are even numbers.
- **Odd numbers** : Numbers ending with 1, 3, 5, 7 or 9 are odd numbers.

SELF TEST - 2

- Which of the following numbers is the largest?
(A) 6892 (B) 5762
(C) 6905 (D) 5965
- Which of the following options are arranged in ascending order for the given numbers?

705, 8261, 954

P Q R

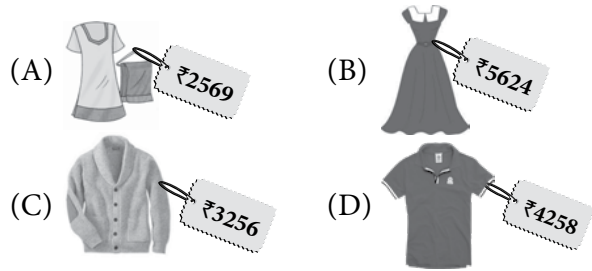
- (A) P, Q, R (B) Q, P, R
(C) Q, R, P (D) P, R, Q

- Compare and fill the box.

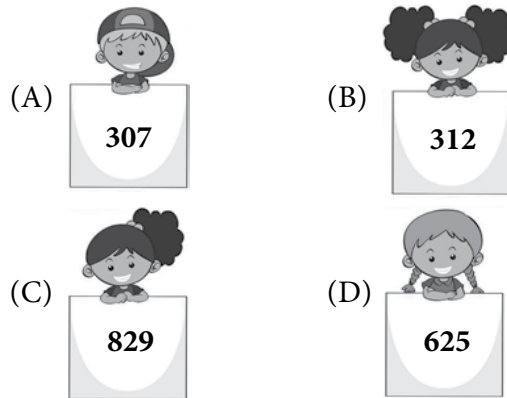
3969 3964

- (A) > (B) <
(C) = (D) Can't be determined

- Manya wants to purchase a dress for her birthday party. She wants to purchase a dress which costs the second lowest. Which dress will she buy?



- Which child holds an even number?



1.6 FORMING NUMBERS WITH AND WITHOUT REPETITION OF DIGITS

Forming Number (without repetition)

The greatest four digit number that can be formed from the digits 2, 0, 1, 8 is 8210.

The smallest four digit number that can be formed from the digits 2, 0, 1, 8 is 1028.

Forming Number (with repetition)

The greatest four digit number that can be formed from the digits 2, 0, 1, 8 is 8888.

The smallest four digit number that can be formed from the digits 2, 0, 1, 8 is 1000.

SELF TEST - 3

- The largest four digit number formed from the digits 2, 6, 8, 0 (with repetition) is _____.
(A) 2608 (B) 8620
(C) 2222 (D) 8888
- Which number is greater : largest four digit number formed from the digits 6, 3, 1, 4 with repetition or number formed without repetition?
(A) Number formed with repetition.
(B) Number formed without repetition.
(C) Both are same
(D) Can't say
- How many four digit numbers can be formed using the digits 5, 2, 4 and 0, each digit used only once?
(A) 4 (B) 12
(C) 9 (D) 18
- Find the smallest 4-digit number formed by using the digits 3, 2, 0 and 6 (with repetition).
(A) 0200 (B) 2036
(C) 6020 (D) 2000
- What is the smallest four digit number that can be formed from the digits 7, 3, 0, 6 (without repeating the digits)?
(A) 0367 (B) 3076
(C) 3067 (D) 3333

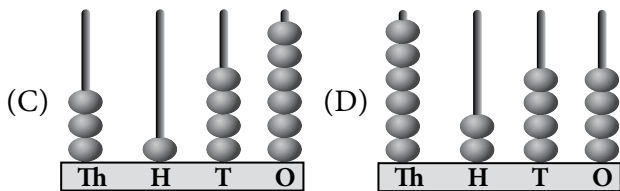
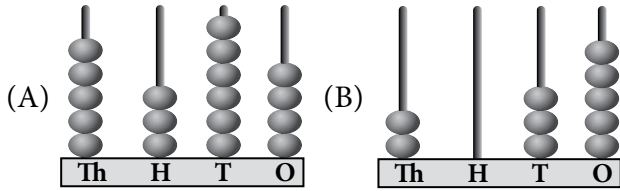


Olympiad Bite

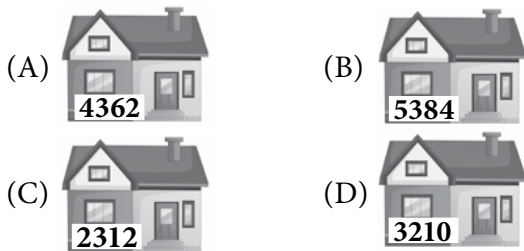
0 cannot be written on the extreme left place of a number, while forming a number.

EXERCISE

1. Which of the following abacuses shows the smallest number?



2. Rohit's house number has 3 at hundreds place. Which could not be his house number?



3. Expanded form of the number 6079 is _____.

- (A) $600 + 70 + 9$ (B) $600 + 7 + 9$
 (C) $6000 + 700 + 9$ (D) $6000 + 70 + 9$

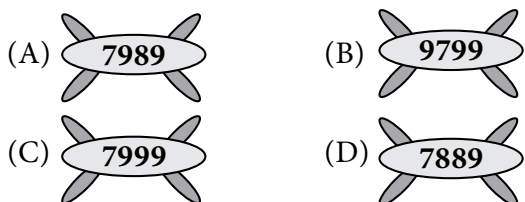
4. Eight thousand three hundred twenty three in numeral form is written as

- (A) 2838 (B) 8210
 (C) 8323 (D) 8332

5. The smallest even number formed by using the digits 0, 2, 7 and 8 (without repeating the digits) is

- (A) 8620 (B) 2078
 (C) 8720 (D) 0872

6. Seven thousand nine hundred and eighty nine is same as _____.



7. The greatest three digit number that can be formed using the digits 9, 2, 5 and 6, if all the digits are different is _____.

- (A) 562 (B) 952
 (C) 965 (D) 999

8. Which of the following options are arranged in descending order?

- (A) 2369, 2069, 2309, 2630
 (B) 2309, 2369, 2069, 2630
 (C) 2069, 2309, 2369, 2630
 (D) 2630, 2369, 2309, 2069

9. Which of the following digits is at the tens place of the smallest 4-digit number that can be formed using the digits of Suhani's house number '3875' (using each digit only once)?

- (A) 3 (B) 5
 (C) 7 (D) 8

10. 6 hundreds 4 tens = _____ hundreds 14 tens

- (A) 5 (B) 2
 (C) 3 (D) 4

11. If hundreds place digit and ones place digit is interchanged in each of the following numbers, then which of the numbers becomes odd?

- (A) 2456 (B) 2820
 (C) 7652 (D) 2546

12. Aman's bird holds a number board. What is the number?



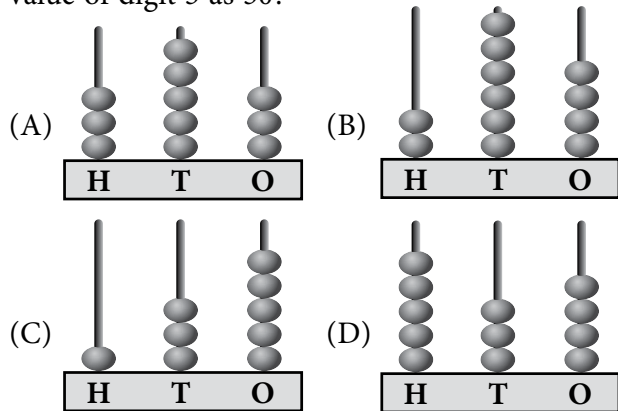
- (A) Eight thousand seven hundred and forty
 (B) Eight thousand eight hundred and four
 (C) Eight thousand seven hundred and four
 (D) Eight thousand eight hundred and forty

13. In how many numbers in the given collection of numbers, the digit '2' has same place value and face value?

5294, 6592, 7024, 5024,
8562, 9082, 3250

- (A) 1 (B) 2
(C) 3 (D) 4

14. Which of the following abacuses has the place value of digit 5 as 50?



15. In 4298, the digit 2 is at _____ place.
(A) Ones (B) Tens
(C) Hundreds (D) Thousands

16. The number name of the smallest four digit odd number is _____.

- (A) Nine thousand nine hundred and ninety nine
(B) One thousand and one
(C) Nine thousand nine hundred and ninety eight
(D) One thousand

17. Puneet search his car in the parking area. His car's number is 'Five thousand three hundred and twenty one'. What is the Puneet's car number in numeral form?

- (A) 3521 (B) 5231
(C) 5321 (D) 5123

18. Select the CORRECT option.

- (A) $7024 > 524 > 2168 > 3102$
(B) $5820 > 621 > 7058 > 5281$
(C) $9261 > 8564 > 7028 > 510$
(D) $1080 > 2100 > 3150 > 4500$

19. If tens place digit and thousands place digit are interchanged in each of the given numbers, then which of the following numbers becomes even?

- (A) 5261 (B) 8564
(C) 7257 (D) 3211

20. Which symbol will make the given number sentence true?

$7000 + 500 + 20 + 5$ $7 \text{ thousands} + 4 \text{ hundreds} + 1 \text{ tens} + 5 \text{ ones}$

- (A) $>$ (B) $<$
(C) $=$ (D) Can't be determined

21. Identify the number.

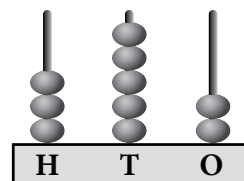
- ▶ It is a 3-digit number.
- ▶ All the digits are different.
- ▶ Digit at ones place is smaller than the digit at tens place.

- (A) 252 (B) 604
(C) 652 (D) 513

22. Select the CORRECT match.

- (A) Two thousand three hundred and thirty six – 2356
(B) Five thousand one hundred and twenty one – 5121
(C) Nine thousand two hundred and sixteen – 9261
(D) Five thousand and thirty nine – 5309

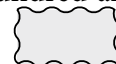
23. The number greater than the number shown on the given abacus is _____.



- (A) 342 (B) 348
(C) 351 (D) 354

24. Compare and fill in the box.

Six thousand five hundred and twenty nine



Six thousand seven hundred and ninety one

- (A) $>$ (B) $<$
(C) $=$ (D) Can't be determined

25. Which of the following does not have the same value as 3954?

- (A) $3000 + 900 + 50 + 4$
(B) $3 \text{ thousands} + 9 \text{ hundreds} + 5 \text{ tens} + 4 \text{ ones}$
(C) $3 \text{ thousands} + 9 \text{ hundreds} + 54 \text{ ones}$
(D) $3000 + 500 + 90 + 4$

26. There are 5894 people in a village. Which of the following options shows the number of people in the village?

- (A) Five thousand nine hundred ninety four
- (B) Five thousand eight hundred forty nine
- (C) Five thousand nine hundred eighty four
- (D) Five thousand eight hundred ninety four

27. The given table shows the number of members in each of two activities in a club. Which number sentence correctly compares these numbers?

Club	
	Number of members
Swimming	3095
Gym	4021

- (A) $3095 < 4021$
- (B) $3095 = 4021$
- (C) $3095 > 4021$
- (D) None of these

28. How many numbers are even in the given collection of numbers?

5491, 2462, 3094, 5000, 8269, 9264, 8091

- (A) 5
- (B) 6
- (C) 4
- (D) 3

29. Which of the following is the greatest 4-digit odd number?

- (A) 1000
- (B) 1001
- (C) 9999
- (D) 9998

30. Which place value will determine the larger number among the two?

9238, 9276

- (A) Ones
- (B) Hundreds
- (C) Tens
- (D) Thousands

Achievers Section (HOTS)

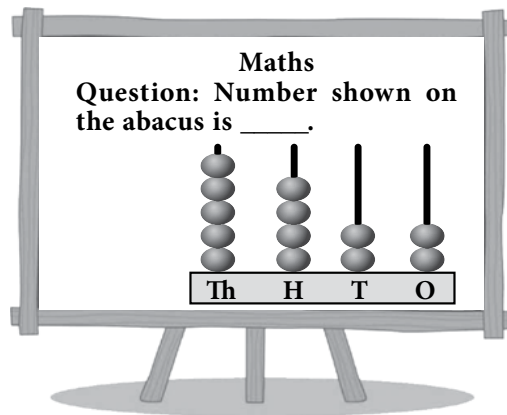
31. Identify the number.

- I am an odd number.
- My tens digit is the greatest one digit number.
- My hundreds digit is one more than ones digit.
- My thousands digit is 1 less than tens digits.



- (A) 8493
- (B) 6482
- (C) 6392
- (D) 7283

32. Three students answered the question shown on the black-board.



Kavya : Five thousand four hundred twenty two.

Priya : Four thousand five hundred twenty two.

Kanika : Five thousand four hundred two.

Who amongst them answered correctly?

- (A) Kavya
- (B) Kanika
- (C) Priya
- (D) None of these

33. Mr Verma has four daughters of different age groups going to an academy for learning dance.

The charges for the academy are given below:

Age (in years)	Charges
1-5	₹ 1050
6-8	₹ 2100
9-12	₹ 3500
13-15	₹ 4250

If one of Mr Verma's daughter is 11 years old, then write her dance charges in expanded form.

- (A) $3000 + 500$
- (B) $1000 + 50$
- (C) $3000 + 100 + 50 + 5$
- (D) $4000 + 200 + 50$

34. Karan saw some refrigerators kept in the shop. He wants to buy the refrigerator which has the minimum price. Help him to arrange the prices of refrigerators (in ₹) in the correct ascending order.



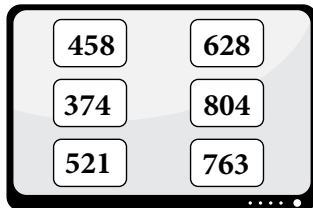
- (A) 1810, 5264, 2368, 3248, 4280
- (B) 2368, 1810, 5264, 3248, 4280
- (C) 5264, 2368, 1810, 3248, 4280
- (D) 1810, 2368, 3248, 4280, 5264

35. Select the CORRECT option.

- (A) $\begin{array}{r} 5000 + \\ 800 + \\ 40 + 2 \end{array}$ 5482
- (B) $\begin{array}{r} 7000 + \\ 400 + \\ 60 \end{array}$ 7460
- (C) $\begin{array}{r} 3000 + \\ 200 + 5 \\ + 4 \end{array}$ 3254
- (D) $\begin{array}{r} 8000 + \\ 200 + \\ 40 + 6 \end{array}$ 8264

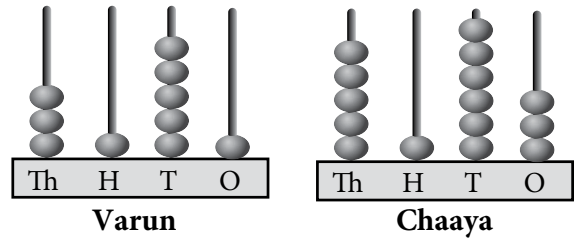
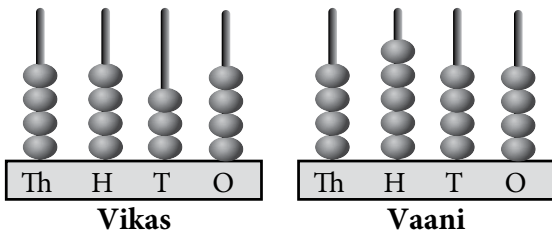
SOF IMO 2019 QUESTIONS

1. Which of the following numbers is not written on the given screen?



- (A) Eight hundred four
 (B) Six hundred twenty eight
 (C) Four hundred thirty eight
 (D) Seven hundred sixty three *(Level-1)*

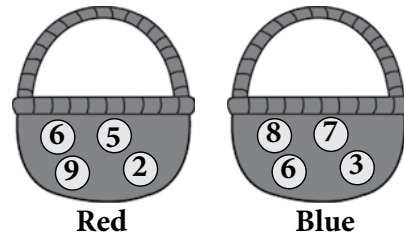
2. Four students put their favourite number on abacus.



Arrange the students in ascending order of their favourite numbers.

- (A) Chaaya, Vaani, Vikas, Varun
 (B) Vaani, Vikas, Chaaya, Varun
 (C) Varun, Vikas, Vaani, Chaaya
 (D) Vikas, Varun, Vaani, Chaaya *(Level-1)*

3. Sohan has two baskets full of some number tokens. He likes the numbers that are in red basket. Which of the following numbers formed by using given basket numbers will he like the most?



- (A) 8763 (B) 6529
 (C) 7563 (D) 6958 *(Level-1)*

4. Which of the following sets of numbers is arranged in the ascending order?

- (A) 982, 985, 989, 789, 925, 1025
 (B) 1920, 1902, 9102, 2109, 9201
 (C) 9876, 9768, 9678, 8976, 8796, 6879
 (D) 1920, 9102, 9321, 9468, 9768 *(Level-2)*

5. Find the smallest 4-digit even number that can be formed using the digits 3, 8, 0, 9 (using each digit only once).

- (A) 3089
 (B) 3098
 (C) 3809
 (D) 3908 *(Level-2)*

HINTS & EXPLANATIONS

SELF TEST - 1

1. (C): Place value of 8 in $9876 = 8 \times 100 = 800$
2. (B): There are 4 thousands in 4050.
3. (D): Place value and face value of a digit are same at ones place.
4. (B): Expanded form of 8236
 $= 8 \times 1000 + 2 \times 100 + 3 \times 10 + 6$
 $= 8000 + 200 + 30 + 6$
5. (C): The largest four digit number is 9999.

SELF TEST - 2

1. (C): 6905 is the largest number.
2. (D): Ascending order of numbers is 705, 954, 8261 *i.e.*, P, R, Q.
3. (A): Digits at thousands, hundreds and tens place are same in both numbers. So, we compare the ones digit. Since, ones digit of number 3969 is more than ones digit of number 3964.
So, $3969 > 3964$
4. (C): Descending order of costs of dresses is 5624, 4258, 3256, 2569
(Lowest)
So, ₹ 3256 is the second lowest cost.
5. (B): Even number ends with 0, 2, 4, 6 or 8.
So, 312 is an even number.

SELF TEST - 3

1. (D): The largest four digit number formed from the digits 2, 6, 8, 0 (with repetition) is 8888.
2. (A): Largest four digit number formed from the given digits with repetition is 6666.
Largest four digit number formed from the given digits without repetition is 6431.
So, 6666 is greater.
3. (D)
4. (D): Smallest 4-digit number formed by digits 3, 2, 0, 6 with repetition is 2000.
5. (C): Smallest four digit number formed by digits 7, 3, 0, 6 without repetition is 3067.

EXERCISE

1. (B): Among the numbers 5364, 2035, 3146 and 6244; 2035 is the smallest.

2. (D): In number 3210, 3 is at thousands place.
3. (D): Expanded form of $6079 = 6 \times 1000 + 7 \times 10 + 9 = 6000 + 70 + 9$
4. (C)
5. (B): Smallest even number formed by digits 0, 2, 7 and 8 without repetition is 2078.
6. (A)
7. (C): Greatest three digit number formed by digits 9, 2, 5 and 6 without repetition is 965.
8. (D): Descending order is 2630, 2369, 2309, 2069
9. (C): Smallest 4-digit number formed using digits 3, 8, 7, 5 is 3578.
So, digit at tens place is 7.
10. (A): 6 hundreds 4 tens = $600 + 40 = 640$
Also, 5 hundreds 14 tens = $500 + 140 = 640$
11. (D): After interchanging the digits at hundreds place and ones place, we get 2654, 2028, 7256, 2645
Only 2645 is odd.
12. (C): 8704 is written as eight thousand seven hundred and four.
13. (C): Digit at ones place has same place value and face value. And, numbers 6592, 8562 and 9082 has 2 at ones place.
14. (A): Place of 5 in number shown by abacus in option (A) is 50.
15. (C): In 4298, digit 2 is at hundreds place.
16. (B): Smallest four digit odd number is 1001 *i.e.*, one thousand and one.
17. (C): Five thousand three hundred and twenty one in numeral form is written as 5321.
18. (C)
19. (B): After interchanging the tens place digit and thousands place digit, new numbers are 6251, 6584, 5277, 1231.
Only 6584 is even.
20. (A): $7000 + 500 + 20 + 5 = 7525$
and 7 thousands + 4 hundreds + 1 tens + 5 ones
 $= 7000 + 400 + 10 + 5 = 7415$
 $7525 > 7415$

21. (C): Only in number 652, all 3 digits are different and $2 < 5$ i.e., ones place digit is smaller than tens place digit.

22. (B): (A) Two thousand three hundred and thirty six = 2336 \neq 2356

(B) Five thousand one hundred and twenty one = 5121

(C) Nine thousand two hundred and sixteen = 9216 \neq 9261

(D) Five thousand and thirty nine = 5039 \neq 5309

23. (D): Number shown on the abacus = 352

Only $354 > 352$

24. (B): Six thousand five hundred and twenty nine = 6529

and six thousand seven hundred and ninety one = 6791

So, $6529 < 6791$

25. (D): (A) $3000 + 900 + 50 + 4 = 3954$

(B) 3 thousands + 9 hundreds + 5 tens + 4 ones = $3000 + 900 + 50 + 4 = 3954$

(C) 3 thousands + 9 hundreds + 54 ones = $3000 + 900 + 54 = 3954$

(D) $3000 + 500 + 90 + 4 = 3594 \neq 3954$

26. (D): 5894 is written as five thousand eight hundred ninety four.

27. (A)

28. (C): Even numbers are 2462, 3094, 5000 and 9264 i.e., 4 in number.

29. (C): Greatest 4-digit odd number is 9999.

30. (C): Since, digits at thousands and hundreds place are same in both the numbers. So, digit at tens place is compared to determine the larger number.

31. (A): Since, the number is odd. So, digit at ones place is 1, 3, 5, 7 or 9.

Greatest one digit number is 9. So, digit at tens place is 9.

Digit at hundreds place is one more than digit at ones place.

Digit at thousands place is 1 less than tens digit i.e., 8.

\therefore Number is 8493.

32. (A): Number shown on the abacus is 5422 i.e., five thousand four hundred twenty two.

\therefore Kavya answered correctly.

33. (A): Charges for age 11 years = ₹ 3500 and expanded form of 3500 = $3000 + 500$

34. (D): Ascending order of given prices is 1810, 2368, 3248, 4280, 5264

35. (B): (A) $5000 + 800 + 40 + 2 = 5842 \neq 5482$

(B) $7000 + 400 + 60 = 7460$

(C) $3000 + 200 + 5 + 4 = 3209 \neq 3254$

(D) $8000 + 200 + 40 + 6 = 8246 \neq 8264$

SOF IMO 2019 QUESTIONS

1. (C): Four hundred thirty eight i.e., 438 is not written on the given screen.

2. (C): Favourite number of Vikas = 4434

Favourite number of Vaani = 4543

Favourite number of Varun = 3151

Favourite number of Chaaya = 5063

Now, $3151 < 4434 < 4543 < 5063$

So, required ascending order is,

Varun, Vikas, Vaani, Chaaya

3. (B): Sohan like the numbers formed by the digits 6, 5, 9, 2.

4. (D): Ascending order means from smallest to largest.

So, 1920, 9102, 9321, 9468, 9768 are arranged in ascending order.

5. (B): Smallest 4-digit even number formed by using the digits 3, 8, 0, 9 without repetition is 3098.