**B.A 2nd Semester, 2024**

**Multidisciplinary Course, FYUGP**

**Sub: Foundation of Mathematical Science**

**Topic: Missing Numbers, Odd man Out, Coding & Decoding**

**…………………………………………………………………………………………………**

**Question:Determine the missing number in the given sequence**

 **1, 3, 5, 7, 11, \_\_, 17, 19**

**Solution:**

Given sequence: 1, 3, 5, 7, 11, ?, 17, 19

The given sequence is in ascending order and it is a prime number list.

As we know, prime numbers are the numbers that are divisible by 1 and the number itself only.

As a result, the missing number in the sequence should be 12.

Hence, the sequence becomes 1, 3, 5, 7, 11, **13**, 17, 19.

**2. Find the missing number from the following?**

|  |  |  |
| --- | --- | --- |
| **6** | **9** | **15** |
| **8** | **12** | **20** |
| **4** | **6** | **?** |

**Solution:**

Using the row-wise logic, we can find the missing number from the given table.

The logic used here is first element in the row + second element in the row = third element in the row:

In first row, 6 + 9 = 15

In second row, 8 + 12 = 20

Similarly, in the third row, 4 + 6 = 10

Hence, the missing number is 10.

**3. Find the missing number:**

|  |  |  |
| --- | --- | --- |
| **3** | **=** | **18** |
| **4** | **=** | **32** |
| **5** | **=** | **50** |
| **6** | **=** | **72** |
| **7** | **=** | **?** |

**Solution:**

Now, let us first find the relation for 3 = 18.

Thus, if we double the square of 3, we get 18.

I.e., 2 × (32) = 2 × 9 = 18

Now, let’s check for second row:

2 × (42) = 2 × 16 = 32

Third row: 2 × (52) = 2 × 25 = 50

Fourth row: 2 × (62) = 2 × 36 = 72

Similarly for fifth row: 2 × (72) = 2 × 49 = 98

Hence, the missing number in the given table is 98.

**4. Determine the missing number:**

|  |  |  |
| --- | --- | --- |
| **188** | **300** | **263** |
| **893** | **?** | **915** |

**Solution:**

First, find the logic for the first row and apply it in the second row to find the missing number.

Logic for first row: (263 – 188) × 4 = 75 × 4 = 300.

Similarly for the second row, we get

(915 – 893) × 4 = 22 × 4 = 88.

Therefore, the missing number is 88.

**5. Find the missing number: 195, 383, 575, 763, 955, \_\_\_ .**

**Solution:**

Given sequence, 195, 383, 575, 763, 955, \_\_\_ .

Go through the given sequence from left to right.

In the given sequence, each number has three digits.

The logic used here is as follows:

* First digit of the number is increased by 2
* Second digit of the number is decreased by 1
* Third digit of the number is decreased and increased by 2 alternatively.

Hence, the missing number in the sequence is 1143.

Therefore, the sequence is 195, 383, 575, 763, 955, **1143**.

**6. Calculate the missing number:**

|  |  |  |
| --- | --- | --- |
| **6** | **1** | **5** |
| **3** | **9** | **10** |
| **4** | **3** | **?** |

**Solution:**

Row wise logic used here is First element in the row + Second element in the row – 2 = Third element in the row.

I.e., First row: 6 + 1 – 2 = 7 -2 = 5

Second row = 3 + 9 – 2 = 12 – 2 = 10

Hence, the third row = 4 + 3 – 2 = 7 – 2 = 5.

Therefore, the missing number in the third row is 5.

**7. Find the missing number from the sequence: 5, 10, 13, 26, 29, 58, 61, \_\_\_.**

**Solution:**

Given sequence: 5, 10, 13, 26, 29, 58, 61, \_\_\_.

In the given sequence, the numbers are multiplied by 2 and increased by 3 alternatively.

I.e. Second number in the sequence = 5 × 2 = 10

Third number in the sequence = 10 + 3 = 13

Fourth number in the sequence = 13 × 2 = 26

Fifth number in the sequence = 26 + 3 = 29

Sixth number in the sequence = 29 × 2 = 58

Seventh number in the sequence = 58 + 3 = 61

Hence, the eight number in the sequence = 61 × 2 = 122.

Thus, the missing number is 122.

So, the sequence is 5, 10, 13, 26, 29, 58, 61, **122**.

**8. Compute the missing number in the sequence: 1, 8, 27, 64, \_\_\_, 216.**

**Solution:**

Given sequence: 1, 8, 27, 64, \_\_\_, 216.

The logic used here is the cube of the natural number

13 = 1

23 = 8

33 = 27

43 = 64

53 = **125**

63 = 216

Thus, the missing number is 125.

Hence, the given sequence is 1, 8, 27, 64, **125**, 216.

**9. Find the missing number:**

|  |  |  |
| --- | --- | --- |
| **2** | **8** | **9** |
| **3** | **2** | **4** |
| **3** | **6** | **?** |

**Solution:**

The rows follow a sequence of square numbers such as 172, 182, and 192, if we read each row as a three digit number.

I.e. = 172 = 289

182 = 324

192 = 36**1**.

Hence, the missing number is 1.

**10. What number should come next in the sequence 22, 21, 23, 22, 24, 23, \_\_.**

**Solution:**

Given Sequence: 22, 21, 23, 22, 24, 23, \_\_.

In the given sequence, the numbers are decreased by 1 and increased by 2 alternatively.

First number: 22

Second number = 22 – 1 = 21

Third number = 21 +2 = 23

Fourth number = 23 – 1 = 22

Fifth number = 22 + 2 = 24

Sixth number = 24 – 1 = 23

Seventh number = 23 + 2 = 25.

**Practice Questions**

1. Find the missing number in the sequence: 53, 53, 40, 40, 27, 27, \_\_\_.
2. Determine the missing number:

|  |  |  |
| --- | --- | --- |
| 2 | 6 | 18 |
| 4 | 20 | 100 |
| ? | 21 | 147 |

1. Find the missing number in the sequence: 664, 332, 340, 170, \_\_\_\_, 89.



**Logic:**
Column-Wise
(First Column Element × 4th Column element) - (2nd column element + 3rd Column element) = Last Column Element

(4×2)-(5+3) = 0
(7×4)-(3+4) = 21
(6×5)-(4+4) = 22
(9×5)-(6+5) = 34.

1. Find the missing number



**Logic:**

First Row Element - Third Row Element = Second Row Element.

56 - 44 = 12
65 - 14 = **51**
78 - 48 = 30.
Hence, in the missing number should be 51.

1. **Find the missing number**



20 = 8 x 2 + 4
15 = 3 x 2 + 9
Hence,
The number on the blank space,
6 x 2 + 6 = **18**.

1. Find the missing term



In the first column,
27- 7 X 2 = 13
In the second column,
144 – 45 X 2 = 54
So,
in the third column,
68 -32 X 2 = **4**

1. **Find the missing term**



**Logic:**

First element + second element = Third Element.
6 + 9 = 15
8 + 12 = 20
4 + 6 = 10
So, required number is 10.

1. Find the missing number?



**Logic (Row-wise):**

(First Element / Second element) \* 2 = Third Element.

So,
(108/x) \* 2 = 18
x = 12.
Missing Number = 12.

1. Find the missing number



**Logic:**

First column => 112 - 12 = 120.
Second Column => 72 - 22 = 45.
Third column => 52 - 32 = **16**

1. **Find the missing number**

1, 4, 27, 16, ? , 36, 343

Solutions: Clearly, the given series consists of cubes of odd numbers and squares of even numbers, i.e 13, 22, 33, 42

So, missing term 53 = 125

1. Find the missing term

4, 6, 12, 14, 28, 30, ?

Solutions: The given sequence is a combination of two series:

1. 4, 12, 28, ?andii. 6, 14, 30, ……….

Now the pattern followed in each of the above two series is: +8, +16, +32

So, the missing number = (28 +32)= 60

1. Find the missing number

1, 3, 3, 6, 7, 9, ?, 12, 21

Solutions: The given sequence is a combination of two series:

1. 1, 3, 7, ?, 21 and ii. 3, 6, 9, 12 ……….

Now the pattern followed in (i) is +2, +4, ………………

And the pattern followed in (ii) is +3

So, the missing number = (7 +6)= 13

1. Find the next two terms in the series
	1. A, C, F, J, ?, ? Ans. O, U
	2. R, U, X, A, D, ? Ans. G
	3. T, R, P, N, L,?, ? Ans. J, H
2. Find the missing term
	1. 4: 17 :: 7: ? Ans.50
	2. 2: 32 :: 3 ? Ans. 243 Hints: 25 =32 & 35= 243

**Coding and Decoding:**

Question: If in a certain code, LUTE is written as MUTE and FATE is written as GATE, then how will BLUE be written in that code.

1. CLUE b. GLUE c. FLUE d. SLUE

Question: In a certain language, MADRAS is coded as NBESBT, how is BOMBAY coded in that language.

1. CPNCBX b. CPNCBZ c. CPOCBZ d. CQOCBZ

Question: If FISH is written as EHRG in a certain code, how would JUNGLE be written in that code?

1. ITMFKD b. ITNFKD c. KVOHMF d. TIMFKD

Question: In a certain code, ROAD is written as URDG. How is SWAN written in that code?

1. VXDQ b. VZDQ c. VZCP d. UXDQ

**Odd man out and series:**

Question: Find the Odd ones 3, 5, 11, 14, 17, 21

1. 21
2. 17
3. 14
4. 3

**Answer:** Option iii

**Explanation:**

Each of the numbers except 14 is an odd number.

The number '14' is the only EVEN number.

Questions: Find the Odd ones of 27, 64, 100, 125, 216, 343

1. 27
2. 100
3. 125
4. 343

**Answer:** Option ii

**Explanation:**

The pattern is 23, 33, 43, 53, 63, 73. But, 100 is not a perfect cube.

Question: Find the Odd one 10, 25, 45, 54, 60, 75, 80

1. 10
2. 45
3. 54
4. 75

**Answer:** Option iii

**Explanation:**

Each of the numbers except 54 is multiple of 5.

Question: Find the odd one 6, 9, 15, 21, 24, 28, 30

1. 28
2. 21
3. 24
4. 30

**Answer:** Option( i)

**Explanation:**

Each of the numbers except 28, is a multiple of 3.

Question: Find the Odd one 41, 43, 47, 53, 61, 71, 73, 81

1. 61
2. 71
3. 73
4. 81

**Answer:** Option (iv)

**Explanation:**

Each of the numbers except 81 is a prime number.