

4. PRIME AND COMPOSITE ① NUMBERS 2025/26

class: VI, MATHEMATICS

FOUNDATION: SOLUTIONS

TEACHING TASK JEE MAINS LEVEL

01.	4	Ans. D
02	$\{2, 3, 5, 7, 11, 13, 17, 19\} \rightarrow \text{total} = 8$	Ans. B
03	97	Ans. D
04	25	Ans. D Ans. B
05	183	
06	$5 = 2 + 3$	Ans. C
07	Conceptual	Ans. B
08	$(3, 5), (5, 7), (11, 13), (17, 19), (29, 31), (59, 61)$ $(71, 73)$	Ans. A
09	$(23, 29)$	Ans. C
10	Conceptual	Ans. D

JEE ADVANCED LEVEL

01.	Twin primes = $(17, 19), (29, 31), (41, 43)$	Ans. A, C, D
02	Not prime = 9, 25, 27	Ans. A, B, C

03	Statement I: Conceptual (True) Statement II: Conceptual (True)	(2) Ans: A
04	Statement I: (13, 14) co-primes (True) Statement II: (21, 28) co-primes (False)	Ans: B
05	Assertion: Conceptual (True) Reason: Conceptual (True)	Ans: A
06	Assertion: Conceptual (True) Reason: Conceptual (False)	Ans: C
07	Twin primes (17, 19)	Ans: B
08	Conceptual	Ans: C
09	Conceptual	Ans: A
10	conceptual	Ans: A
11	Twin prime numbers less than 100 are (3, 5), (5, 7), (11, 13), (17, 19), (29, 31), (41, 43), (59, 61), (71, 73). here $p = 3, 5, 11, 17, 29, 41, 59, 71$. Sum = $3 + 5 + 11 + 17 + 29 + 41 + 59 + 71 = 236$	Ans: 236
12	Multiples of both 2 and 3 = 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96. Total = 16	Ans: 16

- 13
- a) (59, 61) $\rightarrow$ twin primes (P)
- b) (97, 101) $\rightarrow$ prime gap 4 (Q)
- c) (89, 97) $\rightarrow$ prime gap 8 (R)
- d) (71, 73) $\rightarrow$ twin primes (S)
- Ans: P, Q, R, S

- 14
- a) 91 $\rightarrow$ Composite number (P)
- b) 97 $\rightarrow$ prime (Q)
- c) 87 $\rightarrow$ multiple of 3 (R)
- d) 51 $\rightarrow$ multiple of 17 (S)

Ans: P, Q, R, S

LEARNERS TASK

CUQS

01.	111	Ans: A
02	99	Ans: D
03	prime	Ans: D
04	Composite	Ans: D
05	If n is even $\rightarrow 1+3=4$ (Even) If n is odd $\rightarrow 1+3+5=9$ (odd)	Ans: C

06 $2n, n \in \mathbb{Z}$

(4) Ans: A

07 $n \rightarrow \text{Even} \Rightarrow 2+4=6 \text{ (Even)}$

$n \rightarrow \text{odd} \Rightarrow 2+4+6=12 \text{ (Even)}$

Ans: A

08 Conceptual

D

09 Conceptual

D

10 $1+99=100$

Ans: A

JEE MAINS

01. $51 = 5^1 \times 17^1$

No. of factors = $(1+1)(1+1) = 2 \times 2 = 4$ Ans: C

02 Prime triplets are sets of three numbers that differ by 2 and 4.

Ex: $(5, 7, 11), (7, 11, 13), (11, 13, 17), (13, 17, 19)$

Ans: —

03 Factors of 43 = 1, 43

Sum = $1+43=44$

Ans: B

04 Conceptual

Ans: A

05 199

Ans: C

06 Conceptual

Ans: B

07 Least prime = 2

Least Even number = 0

Least odd number = 1

Sum = $2+0+1=3$

Ans: —

08 $2367 + 3592 + 4572$

$\boxed{7} + \boxed{2} + \boxed{2} = \boxed{11}$ (5)

$\therefore$ Odd number

Ans: B

09 $7268 \times 72963 \times 4572$

$\boxed{2} \times \boxed{3} \times \boxed{2} = \boxed{12}$

$\therefore$ Even number

Ans: B

10 Conceptual

Ans: B

11 prime numbers b/w 4 and 30

sum = $5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 = 124$

Ans: —

12 Given $a^2 - b^2 = \text{prime number}$

$\Rightarrow (a+b)(a-b) = \text{prime number}$

For $a^2 - b^2$ to be a prime, one of the factors must be either -1 or 1

(since prime number's factors only 1 and itself).

possible cases:

(i) $a - b = 1$

(ii) $a + b = 1$ (Typical context)

Conclusion: $a - b = 1$

Ans: B

13

13 $a^2 + b^2 + 2ab = (a+b)^2$, which is a perfect square

A) $a+b=6 \Rightarrow (a+b)^2 = 36$, not a prime no. 6

B) $a+b=5 \Rightarrow (a+b)^2 = 25$, not a prime no.

C) $a+b=7 \Rightarrow (a+b)^2 = 49$, not a prime no.
Ans. D

14 53

Ans. C

15 A) $K=1 \Rightarrow 2^K + 1 = 2^1 + 1 = 3$

$K=2 \Rightarrow 2^2 + 1 = 4 + 1 = 5$

Ans. A

JEE ADVANCED LEVEL

01. Odd numbers $\rightarrow (5, 7), (11, 13), (17, 19)$

Ans. A, B, C

02 Conceptual

Ans. A, C, D

03 Statement I:

Since 27 is not a prime number (True)

Statement II: 23 will not be marked,

Since it is a prime number (False) Ans. C

04 Statement I: Conceptual (True)

Statement II: Conceptual (False)

Ans. C

05 Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans. A

06 Assertion: Conceptual (False) ⑦
Reason: Conceptual (False) Ans: —

07 Factors of 91 = { 1, 7, 13, 91 } Ans: C

08 17 Ans: C

09 Conceptual Ans: B

10 (12, 15) Ans: B

11. (2, 15), (4, 15), (6, 15), (8, 15), (10, 15), (12, 15),
(14, 15), (16, 15), (18, 15), (20, 15).
The even numbers co-prime with 15 are
2, 4, 8, 14, 16.
 $\therefore \text{Total} = 5$ Ans: 5

12 Sum = 2 $\rightarrow$ 11
Sum = 3 $\rightarrow$ 21, 3
Sum = 5 $\rightarrow$ 23, 41, 5
Sum = 7 $\rightarrow$ 25, 43, 61, 7
Sum = 11 $\rightarrow$ 29, 47, 65, 83
Sum = 13 $\rightarrow$ 49, 67, 85
Sum = 17 $\rightarrow$ 89.
 $\therefore \text{Total} = 18$ Ans: 18

8

- 13 a) $(5, 9) \rightarrow$ Co-primes (s)
 b) $(14, 21) \rightarrow$ Not-Co-primes (q)
 c) $(17, 19) \rightarrow$ Twin primes (s)
 d) $(23, 25) \rightarrow$ Co-primes (s)

Ans: a, c, d

- 14 a) $15 \rightarrow$ Composite and odd
 b) $11 \rightarrow$ prime and odd
 c) $2 \rightarrow$ prime and even
 d) $6 \rightarrow$ Composite & even number

Ans: a, c, d

 $\Rightarrow$ THE END $\Leftarrow$